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The Financial and Economic Impact of the Fall River CSO Project

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Prepared by

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and
William Hogan, Economics Department

Center for Policy Analysis

University of Massachusetts Dartmouth

February 1994

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Executive Summary

A number of significant findings have emerged from this study of the proposed Fall River CSO project:

- (1) Federal construction assistance to communities has declined by more than 50% in real dollars during the last 13 years. The original clean water standards imposed in 1972 have remained unchanged and their scope has been expanded by redefining combined sewer overflows as a point source of pollution.

- (2) The authors estimate that in Massachusetts, CSO abatement capital costs will be approximately $4.9 billion over the next 15 years if the state is to meet the standards set by its own CSO Control Policy.

- (3) Under existing statutes, Fall River will be eligible to receive only a 25% grant equivalency award for the Phase III Construction of the CSO Project. There is no guarantee that the CSO project, or any portion of it, will be financed by the Massachusetts Water Pollution Abatement Trust because (1) current funding levels for the MWPAT are inadequate to finance even the projected CSO needs in Massachusetts, and (2) secondary treatment continues to receive the highest priority in funding eligibility. Thus it is very possible that the City of Fall River will have to finance all or a substantial portion of the CSO project with a municipal bond issue.

- (4) According to all standard measures, Fall River's fiscal capacity is among the weakest of municipalities in the Commonwealth of Massachusetts.

- (5) According to all standard measures, Fall River's fiscal effort is far above the state average in taxing commercial and industrial property, but is far below the state average in the taxation of residential property and in levying water and sewer fees.

- (6) The authors conclude that the low fiscal effort on residential taxation may be explained by the City's economic distress, particularly exceptionally low household incomes and high rates of unemployment.

- (7) The authors conclude that low water and sewer fees are a central component of Fall River's economic cost advantages with respect to business firm location decisions and constitute one of the City's chief competitive advantages in retaining its manufacturing base, particular textile companies and other water-intensive industries.

- (8) Fall River currently has an average debt load, measured in various ways. Its low fiscal capacity, however, means that the City can generate only below average per capita revenues to repay bonded indebtedness.

- (9) Regardless of the source of funding, the CSO project will have a negative impact on Fall River's bond rating. It is like that Fall River's municipal bonds will be downgraded to "junk" status (Ba1, Ba or lower). The CSO project will consume the City's entire debt capacity, effectively prohibiting the City from financing any other capital project for the next 10 to 15 years or longer.

- (10) Three finance scenarios have been constructed to assess the probable impact of the CSO project on the municipal budget. The best case scenario involving full financing by MWPAT will require $7.86 million per year in additional annual revenue. This could be achieved by a 331% increase in sewer rates or a 24.8% across-the-board increase in property tax rates.

- (11) An intermediate scenario involves half financing by MWPAT and half financing by the City. It will require $10.75 million in additional annual revenues. This could be achieved by a 416% increase in sewer rates or a 34.9% across-the-board increase in property tax rates.

- (12) The worst case scenario is full financing by the City. This scenario will require $13.62 million per year in additional revenues. This could be achieved by a 501% increase in swere rates or a 43.08% across-the-board increase in property tax rates.

- (13) Even the best case scenario would be in conflict with Massachusetts's Proposition 2-1/2 which limits the amount of tax revenue a municipality can raise. The worst case scenario would cause Fall River to exceed the statutory debt limit and would require special action by the Massachusetts legislature.

- (14) The City's economic base is exceptionally dependent on the textile finishing industry and on other water-intensive industries. Firms in these industries are being actively recruited with very attractive economic development packages by southern states.

- (15) Water and sewer rates are among the last competitive advantages that Fall River enjoys in retaining its economic base industries. We predict that anything beyond a doubling of sewer fees will eliminate that competitive advantage and put at risk of migration or closure Fall River's water-intensive firms. Consequently, even under the best case scenario, Fall River is likely to lose some major employers to other states. Local expansion by Fall River firms will become extremely unlikely, and Fall River will be less likely to attract new firms in the future.

- (16) All presently-possible funding scenarios would increase sewer fees or property taxes or both in order to repay the bonded indebtedness required to finance the CSO project. Yet the research presented in this study suggests that there will be a significant response to such rate increases such that the City is likely to collect less revenue, not more. Firms appear willing to relocate or may be forced to close due to a loss of competitive advantage in competitive world markets. Alternatively, other firms appear willing to cease production of water-intensive products or substitute conservation technologies. While such action would reduce the industrial wastewater flow into the Fall River sewer system, they would not eliminate the overflow problem that occurs during heavy rainstorms. These actions would, however, reduce the funding available to repay bonded indebtedness financing the CSO project. There is at least the possibility that the City may not be able to issue the amount of bonds required to finance the CSO project because financial markets may hesitate to fund an investment about which there are questions as to the City's ability to repay the bonded indebtedness.

- (17) If an increase in sewer fees or property taxes or both were to cause the textile industry in Fall River to exit or fail, the loss of jobs would cause the unemployment rate in the Fall River Labor Market to increase to nearly 20% and to exceed 20% in the City itself. The loss of earnings is estimated at $195 million per year, considerably in excess of the one-time cost of the CSO project of $130 million.

Chapter 1

Introduction

Working through the Center for Policy Analysis at the University of Massachusetts Dartmouth, Professor Clyde W. Barrow of the Political Science Department and Professor William Hogan of the Economics Department conducted this study of the financial and economic impact of the proposed combined sewer overflow (CSO) project on the City of Fall River. Both Barrow and Hogan are Research Associates of the Center for Policy Analysis and full time members of the University faculty. The study was undertaken at the request of the City of Fall River and includes the following components:

Chapter 2 presents a legal history of the CSO project and a description of Fall River's CSO problem. The nature of combined sewer overflow systems is surveyed and the specific structure of the Fall River system is described. Federal and state statutes as well as the Federal District Court's decision mandating the CSO project are reviewed and summarized. Patterns of federal and state funding methods are presented. The history of legislation pertaining to CSOs is traced and its impact on the City of Fall River is analyzed.

An analysis of Fall River's fiscal operations with emphasis on the CSO project is given in Chapter 3. This includes comparative analyses of Fall River's fiscal capacity and fiscal effort. Fiscal capacity analysis attempts to evaluate the ability of a municipality to fund capital projects. Fiscal effort analysis attempts to evaluate how extensively a municipality is using its potential fiscal resources. The City's capacity to incur additional bonded indebtedness is evaluated.

The impact of three funding scenarios is estimated: (1) a 25% grant equivalency award from the state revolving fund of the entire cost of the CSO project (the best case scenario), (2) a 25% grant equivalency award for half of the cost of the CSO project (the intermediate case scenario), and (3) 100% financing by the City (the worst case scenario). For each scenario, an analysis is provided of the impact on the City's bond ratings, increase in total City bonded indebtedness, comparative impact of water and sewer fee increases on business and residential users, impact on the City's tax and fee burden.

Various indices are devised and calculated for Fall River and all other Massachusetts cities and towns to compare both capacity and effort of Fall River's fiscal operations. Costs are identified in absolute terms and in terms of percentage of per capita income and the tax base. Comparisons with selected other Massachusetts cities and towns and the state average are made to assess Fall River's relative fiscal situation. Information on municipal finances in the Commonwealth for this component of the study was obtained from the Massachusetts Department of Revenue's electronic database and from City offices.

The chapter concludes with an identification and assessment of capital funding needs for schools, roads, public safety, and other public works that the City would not be able to undertake if it has to fund the CSO project.

In Chapter 4 the results of a comprehensive economic base study of Fall River are presented. Published and unpublished data were used to describe the economic structure of the City, its labor force, and its industrial structure. The City's history of high unemployment over the previous business cycle (1986 - 1993) is demonstrated. The present composition of the labor force by industry and occupation category is described, as are trends in industrial structure. Fall River's labor force is compared with that of the other Labor Market Areas in the state and the state as a whole. Results from the analysis of industrial structure include Fall River's heavy dependence for employment and income on industries that use substantial amounts of water and thus generate much wastewater requiring sewage disposal in their production processes. Based on the United States Department of Commerce's Regional Impact Multiplier Series, Chapter 4 includes an analysis of the loss water-intensive firms. The implications for financing the CSO project from either sewer fees or property taxes are considered. Significant adverse impacts on both the employment base and the City's tax base raise questions about the City's ability to finance the project without federal aid.

To investigate the sensitivity of Fall River firms to the increased costs of business that would occur as a result of the CSO project, interviews with 16 executives at 13 firms were conducted. Firms interviewed included all of Fall River's major employers and all major water and sewer users except for hospitals. The motivation for the interviews was a concern that a substantial increase in user fees may drive textile finishing firms and other businesses out of the City. The departure of these firms would have an adverse impact on the tax base and would reduce the City's bonding capacity. Results of the interviews are summarized in Chapter 5.

A summary of the major findings of the study is given in Chapter 6.

Chapter 2

THE FEDERAL WATER POLLUTION CONTROL ACT: A NATIONAL POLICY, A LOCAL MANDATE

> It is the national policy that
> federal financial assistance be
> provided to construct publicly
> owned waste treatment works...
>
> - Clean Water Act of 1977

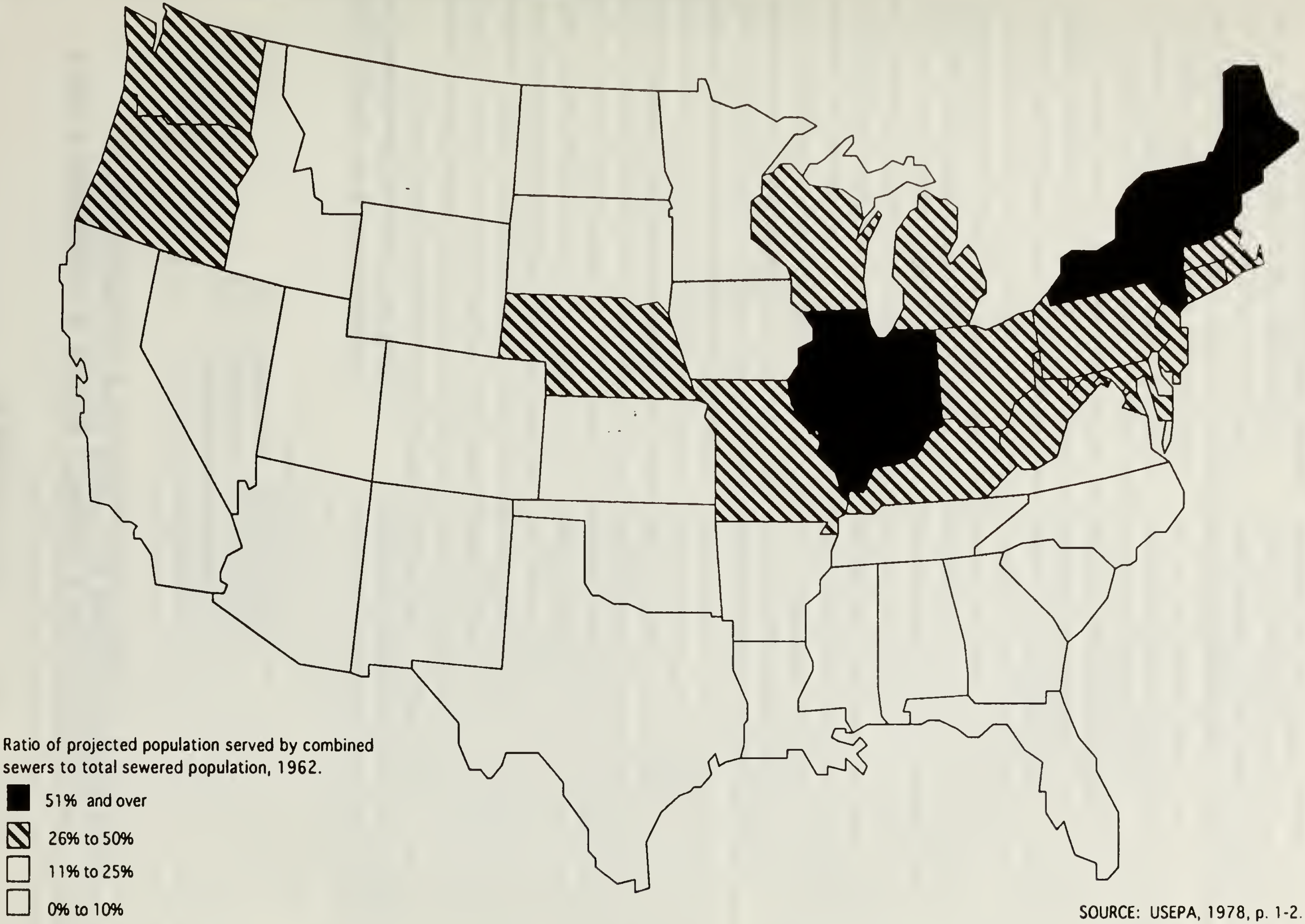
The Nature and Distribution of Combined Sewer Overflows

In most cities throughout the United States, sewer lines and stormwater collection systems were first constructed in the 1800s and early 1900s. Typically, sewer lines were the first to be laid in order to carry raw sewage from urban residential areas and business districts. Sewer lines were later followed by stormwater drainage systems designed to collect rainwater during storms so as to reduce or eliminate urban flooding. In many cases, sewer lines and stormwater conduits were connected into a single collection system called a combined sewer. By definition, a combined sewer is a single collection system that conveys both sewage and stormwater. The U.S. Environmental Protection Agency estimates that there are between 1,100 and 1,300 combined sewers in the United States serving forty-three million people (USEPA 1978; USEPA 1985). Combined sewers are located primarily, although not exclusively, in the Northeast and Great Lakes area. Eleven states in these two geographic areas account for eighty-five percent of the water quality problems attributed to combined sewer overflows nationwide (Morandi 1992; See Figure 2.01on the following page). Only eight states account for seventy percent of the assessed construction needs for water pollution abatement caused by combined sewer overflows (See Figure 2.02).

In their earliest phase of development, sewer lines and stormwater collection systems were designed to discharge directly into receiving waters such as rivers, lakes, bays, and estuaries. These designs were developed long before the adverse health and environmental effects of such discharges were understood by scientists, government officials, or the general public. However, as part of an emerging public awareness and concern over such effects, the U.S. Congress passed the U.S. Public Health Act and the Federal Water Pollution Control Act of 1948. Cities and towns that had not already done so were required to build primary wastewater treatment facilities to strain and disinfect raw sewage before discharging it into receiving waters.

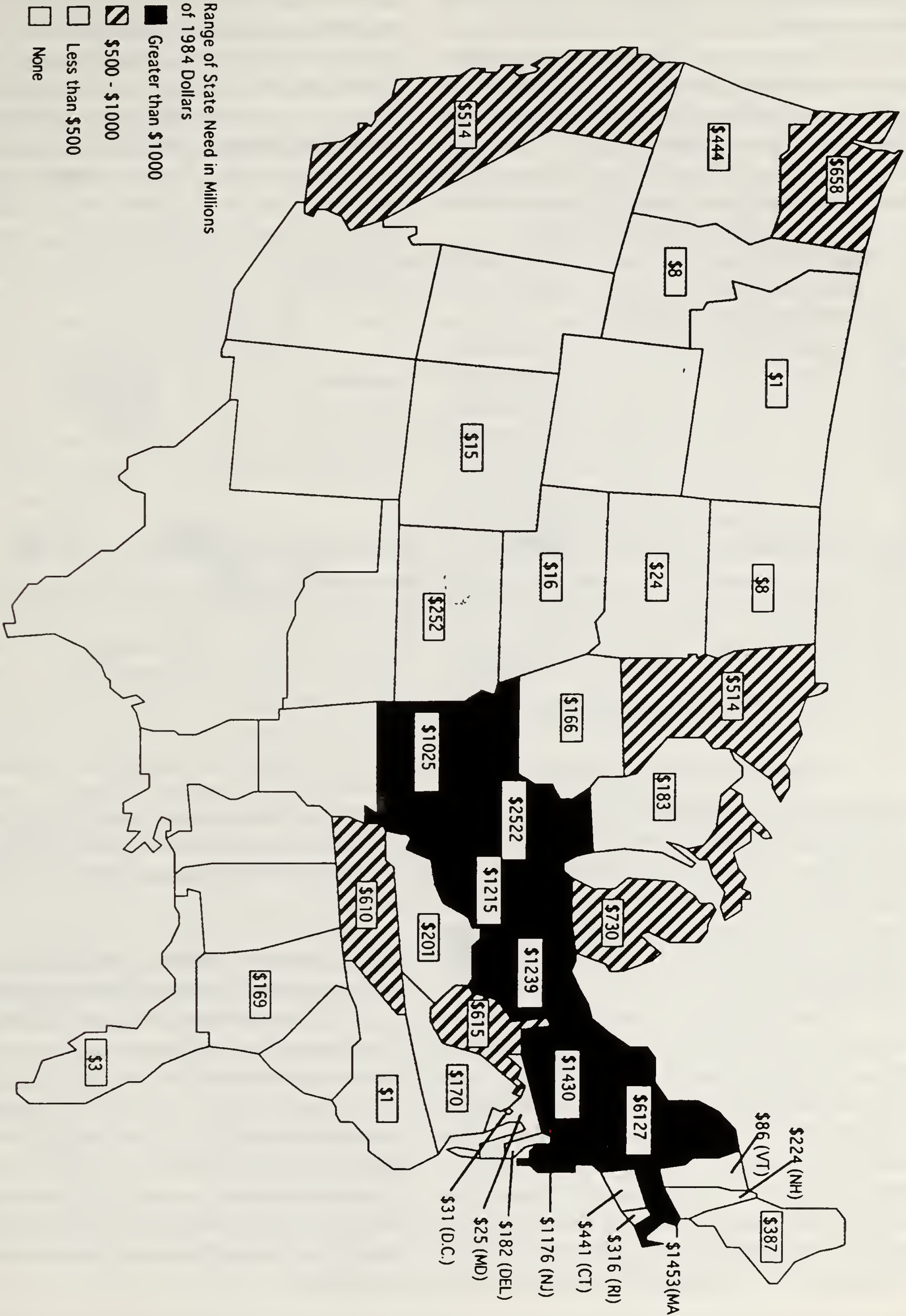
However, in addition to the construction of primary treatment facilities, municipalities with combined sewers encountered a derivative problem. Publicly owned treatment works (POTWs) are designed to process normal dry weather sewage flows that come to the treatment facility from the collection system. During rainfall events, additional flows of stormwater enter a combined sewer through street inlets. This combined flow of sewage and storwater runoff will often exceed the intake capacities of a POTW. Thus, if a combined sewer can discharge only through the POTW, the treatment facility will be overloaded with stormwater and cause an extreme event outfall of untreated combined sewage into the receiving waters; or to prevent an overload of the POTW, excess flows may be contained in the collection system where they

FIGURE 2.01. GEOGRAPHIC DISTRIBUTION OF POPULATION SERVED BY COMBINED SEWER SYSTEMS.


Ratio of projected population served by combined sewers to total sewered population, 1962.
■ 51% and over
▨ 26% to 50%
☐ 11% to 25%
☐ 0% to 10%

SOURCE: USEPA, 1978, p. 1-2.

FIGURE 2.02. 1984 COMBINED SEWER OVERFLOW NEEDS BY STATE.



SOURCE: USEPA 1985, P. 14.

back up and cause localized flooding of combined sewage in residential areas and business districts.

The standard solution to the problem of excess combined flows has been to construct diversionary chambers at key points throughout a collection system. As Figure 2.03 illustrates, the trunk lines of a combined sewer are now typically routed into regulator chambers that partially block outfalls to receiving waters with either a fixed or moveable interceptor. Under normal dry weather conditions, raw sewage flows are diverted into lines that carry the flows to the POTW where sewage is treated before it is discharged into receiving waters.

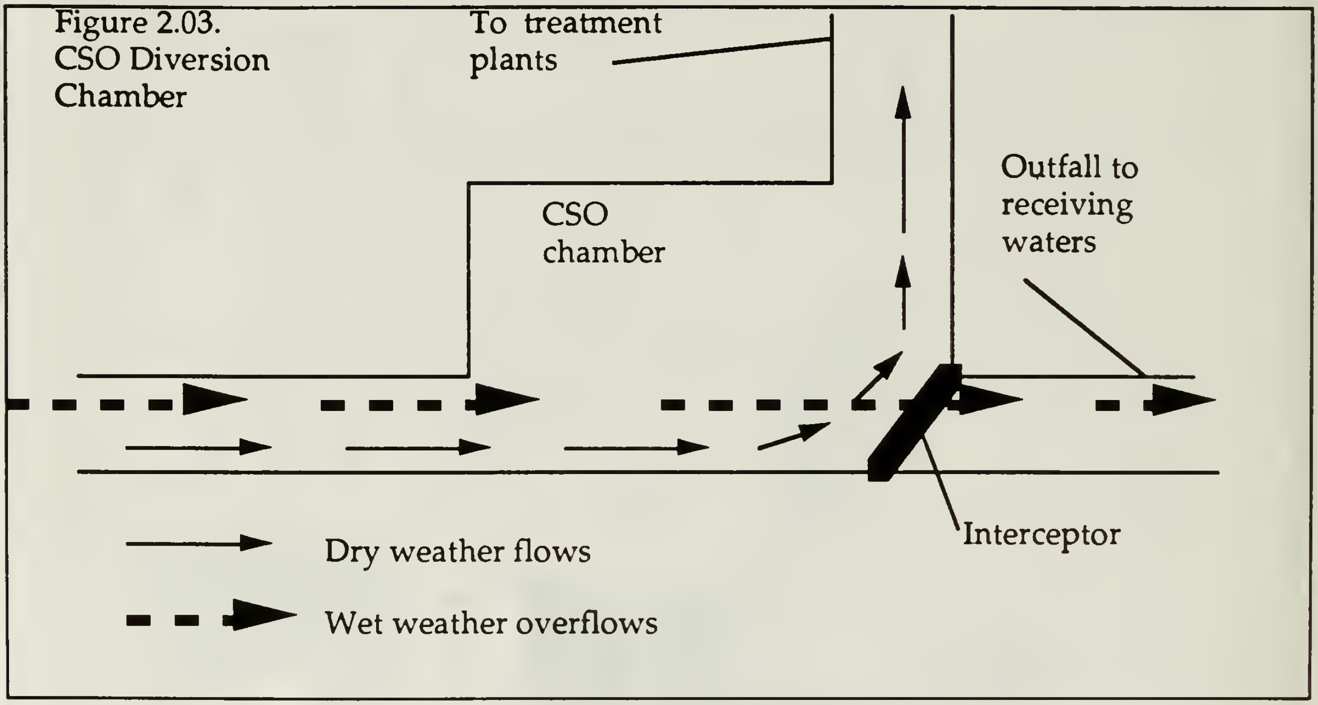


Figure 2.03. CSO Diversion Chamber

During a storm event, the water level rises in a combined sewer and, by design, the excess combined sewer flow (CSF) will begin to overflow the interceptors and be discharged directly into receiving waters without treatment. Importantly, combined sewer overflows not only contain untreated sewage, but stormwater runoffs entering the system also gather dry weather pollutants that have accumulated on the streets, in the gutters, and on the roofs of buildings. In addition, dry weather sediments that have accumulated in the sewers are resuspended as the velocity of combined flow increases due to the rising volume of stormwater.[1] Therefore, the untreated effluents of a combined sewer overflow often contain unhealthy and environmentally dangerous levels of fecal matter, sediment, microorganisms, oil and grease, toxic metals, organic pollutants, and other storm debris (Crawford and Goodwin 1984; USEPA 1980; USEPA 1979; Olivieri, Kruse, and Kawata 1977).[2]

The Federal Water Pollution Control Act: An Evolving National Policy

The problem of water pollution caused by untreated or inadequately treated wastewater was revisited by the U.S. Congress in the Federal Water Pollution Control Act Amendments of 1972. This legislation established the fundamental principles and objectives of national wastewater management policy. Section 101(a) of the 1972 legislation established an ambitious national mandate by declaring:

The Objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this Act —
(1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;
(2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;
(3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;
(4) it is the national policy that federal financial assistance be provided to construct publicly owned waste treatment works...

To achieve these goals, the Federal Water Pollution Control Act Amendments of 1972 established a national program to regulate the discharge of pollutants into surface waters. The legislation created a National Pollutant Discharge Elimination System (NPDES) that requires point source polluters to obtain a permit for discharges into U.S. waters. Generally, point sources consist of industrial process wastewater outfalls and sewage outfalls from municipal treatment plants.[3] The legislative guidelines for the National Pollututant Discharge Elimination System mandate that point source dischargers must comply with specific technology-based requirements. For instance, the effluent limitations for all publicly owned treatment works are based on levels achieved by the implementation of secondary treatment (40 CFR Part 133).

Under the 1972 legislation, individual states can assume authority for the administration of NPDES once their permitting processes are approved by the U.S. Environmental Protection Agency. The law requires that state water quality standards must be consistent with federal policy but, if necessary to achieve the Act's objectives, states are allowed to impose water quality strandards more stringent than those specifically required by federal regulations. Thirty-eight states currently operate EPA-approved NPDES permitting programs. Massachusetts is one of only twelve states where the EPA is still jointly responsible for issuing NPDES permits (Morandi 1992).

Importantly, the 1972 legislation explicitly linked the achievement of national water quality goals to federal financial assistance for municipalities affected by the new mandate (Section 101(a)(4)). The Federal Water Pollution Control Act' Amendments of 1972 effected this linkage by creating a Construction Grants Program (CGP) that was designed to heavily subsidize the construction of publicly owned treatment works (POTWs). The U.S. Environmental Protection Agency was charged with administering the Construction Grants Program. Moreover, to provide the U.S. Congress with guidance in funding the CGP, the EPA is required to develop biennial estimates "of the cost of construction of all needed publicly owned treatment works in each of the States" (Section 516. (b)).

The Clean Water Act of 1977

The national water quality goals established by the Federal Water Pollution Control Act Amendments of 1972 were incorporated unchanged into the Clean Water Act of 1977 which extensively amended the earlier legislation. Significantly, for first time, section 70 of the Clean Water Act specifically directed the EPA to "report on the status of combined sewer overflows in municipal treatment works operations" by the following year.[4] Combined sewer overflows from publicly owned treatment works were not covered explicitly by NPDES in either the 1972 or the 1977 legislation. NPDES regulates point sources of water pollution, while scientists, engineers, and EPA officials considered combined sewer overflows to be *nonpoint* sources of pollution. Consequently, it was generally assumed that stormwater discharges from combined sewer overflows were exempt from NPDES permits and, for this reason, CSOs were never specifically covered by the EPA's NPDES regulations (Morandi 1992, 1).

Nevertheless, various legal challenges in the federal courts challenged the prevailing interpretation of the regulatory status of CSOs. The federal courts recognized stormwater and CSO discharges as point sources of water pollution. Therefore, communities that had met the NPDES technology-based requirement for secondary treatment at their POTWs were increasingly deemed subject to legal action for combined sewer overflows that violated the water quality standards established by the Clean Water Act of 1977.

The U.S. Congress made a major policy departure by embracing the federal courts' opinion on this matter in the Water Quality Act of 1987. Section 405 of the Water Quality Act amended the earlier legislation to require NPDES compliance for any stormwater discharge "that contributes to a violation of a water quality standard or is a significant contributor of pollutants to waters of the United States." In this regard, the legislation directed the Environmental Protection Agency to establish permit application requirements regulating municipal stormwater discharges. The EPA issued a National Combined Sewer Overflow Control Strategy on August 10, 1989. The Control Strategy emphasizes, quite explicitly, that CSOs are point sources of pollution subject to NPDES permits.[5]

The National CSO Control Strategy covers approximately 1,200 municipalities, including the City of Fall River, Massachusetts (Simpson 1993; Hall Rissetto, and Santarella, Jr. 1989). The national policy establishes three major criteria for CSO control:

* the policy allows no more than an average of four overflows per year for an urban area, and no more than five in rural areas,
* the policy calls for treatment of at least eight-five percent of the volume of the combined sewage in the combined sewer system during rainfall events on a system-wide average basis,
* the policy establishes nine other minimum controls that prohibit CSO discharges in dry weather, regulate solid materials, require proper maintenance and monitoring of CSO facilities, and require public notification of CSO discharges.[6]

The new Control Strategy also directed the individual states to develop statewide CSO permitting strategies by January 1, 1990. More than thirty states, including Massachusetts, had received EPA approval for their CSO control strategies as of April 6, 1992, (Morandi 1992, 3). The Massachusetts CSO Control Strategy (1990) has identified twenty-six communities and sewer districts in Massachusetts, including Fall River, with combined sewer overflow problems. These twenty-six communities and districts serve a population of almost two million or roughly one-third of the state's total population. The Control Strategy estimates that CSO abatement in the Commonwealth will take at least fifteen to twenty years and concludes that "the limitation in funds will be the major obstacle to achieving water quality standards in [the state's] CSO impacted areas" (Comm. of Mass. 1990, 1).

Federal Funding of Water Pollution Abatement

The Federal Water Pollution Act Amendments of 1972 established an ambitious national mandate to improve water quality over a relatively short period of time. Subsequent amendments to the original legislation (1977, 1981) have reiterated the same national goals, while extending those goals in 1987 to include the problem of combined sewer overflows. A crucial component of the original national mandate was the establishment of a "national policy that federal financial assistance be provided to construct publicly owned waste treatment works" (Section 101(a)(4)).

As noted above, the Federal Water Pollution Control Act Amendments of 1972, Section 201(a), established the Title II Construction Grants Program (CGP) to support "the development and implementation of waste treatment management plans and practices which will achieve the goals of this Act." Initially, the EPA's Construction Grants Program provided direct federal grants to municipalities and special districts for the construction of publicly owned treatment works, including combined sewer overflow projects. The federal grants normally covered seventy-five percent of the cost of constructing the most cost effective alternative for providing the necessary wastewater treatment (Walton and Hathaway 1979, 6-7).

The 1972 and 1977 legislation allotted funds from the Construction Grants Program among the individual states "in the ratio that the estimated cost of constructing all needed publicly owned treatment works in each State bears to the estimated cost of construction of all needed publicly owned treatment works in all of the States (Section 205(a)). Each state's allotment under this formula was allocated directly to municipalities and special districts for individual construction projects on the basis of state priority ratings developed by each state. The federal regulations governing the EPA's Construction Grants Program specified that state's were to rate individual projects within their jurisdiction on the basis of four criteria:

1. severity of the pollution problem,
2. size of the population affected,
3. the need for preservation of high quality waters,
4. at the state's option, the category of need addressed.

The "categories of need" (item 4 above) consisted of secondary treatment, more stringent treatment, correction of infiltration and inflow problems, sewer system replacement or major rehabilitation, new collectors and appurtenances, new interceptors and appurtenances, and the correction of combined sewer overflow problems (Clean Water Act, Section 216). Each state was given the sole authority to determine the relative weight given to each of the four criteria, as well as the sole authority to determine the priority of the different categories of need (40 CFR 35.915, 37 FR 11650). Thus, whether a given combined sewer overflow project fell within a fundable part of a state's priority list was dependent on state policy and on the severity of the combined sewer overflow problem.

Furthermore, the Environmental Protection Agency stipulated that combined sewer overflow projects could qualify for federal grant assistance only if several additional criteria had been met (EPA 1976a and 1976 b):

* The proposed level of CSO control was necessary to protect a beneficial use of the receiving water even after technol ogy-based standards had been achieved by industrial point sources and at least secondary treatment had been achieved for dry weather municipal flows;

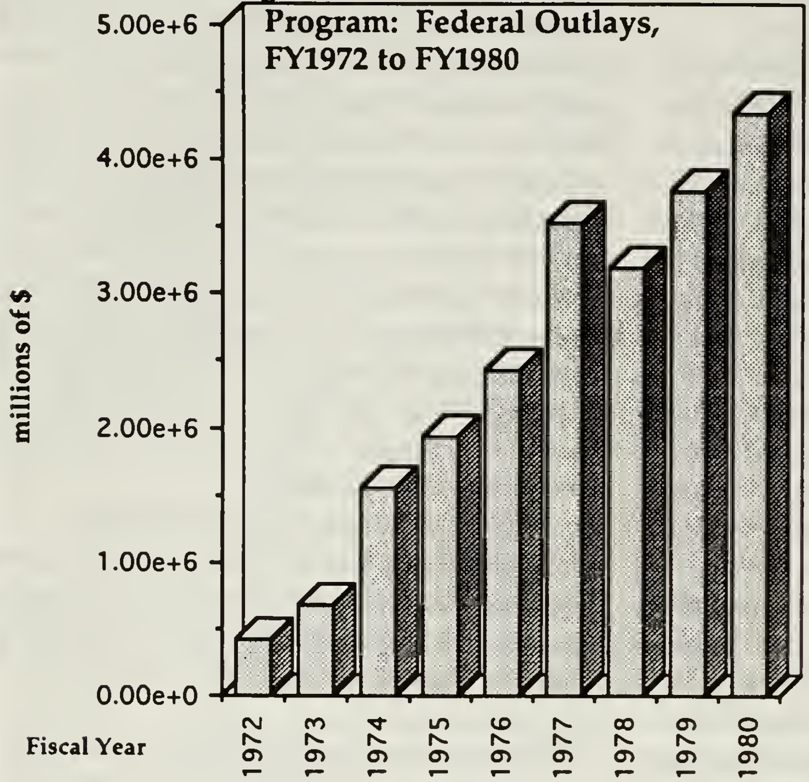
* Secondary treatment of dry weather municipal flows had been achieved, or provision for funding of secondary treatment had already been made;

* The proposed CSO control technique would be cost effective than other CSO control techniques and more cost effective than the addition of higher than secondary treatment for dry weather municipal flows;

* The marginal costs were not substantial compared to marginal benefits.

As noted above, the Clean Water Act of 1977, directed the Environmental Protection Agency to "report on the status of combined sewer overflows in municipal treatment works operations" and to conduct a CSO needs assessment based on current applications for CSO project funding under the Construction Grants Program. The Act further stipulated that the report should determine the number of years necessary, "assuming an annual authorization and appropriation for the construction grants program of $5,000,000,000, to correct combined sewer overflow problems" (33 U.S.C. 1375, Section 70(c)). Based on this fiscal assumption, the EPA estimated that CSO control would take a minimum of ten years to complete under optimal conditions and perhaps as much 40 years to correct in some states (EPA 1978, ES-3). However, in calculating these estimates, the EPA emphasized to Congress and the President "the importance of maintaining constant buying power in the construction grants program if CSO correction is to be achieved in a reasonable period of time" (Ibid., ES-1). In fact, federal outlays for the Construction Grants Program increased during the 1970s, but actual outlays never reached the $5 billion promised by the 1977 legislation (See Figure 2.04). CGP outlays reached a peak of only $4.3 billion in Fiscal Year 1980 and have been declining since that time.

Figure 2.04. Construction Grants Program: Federal Outlays, FY1972 to FY1980



Indeed, the Municipal Wastewater Treatment Construction Grant Amendments of 1981 marks the beginning of a formal retreat in the federal government's financial commitment to national water quality goals. First, the Construction Grant Amendments imposed a requirement that, effective October 1, 1984, no less than eighty percent of each state's CGP allotment "shall be made only for projects for secondary treatment or more stringent treatment, or any cost effective alternative thereto, new interceptors and appurtenances, and infiltration-in-flow correction" (33 U.S.C. 1281, Section 201(g)(1)). This change effectively mandated secondary treatment as the top priority for the Construction Grants Program, even as federal courts were bringing CSO problems under the jurisdiction of the Clean Water Act.

The effect of this change was partially offset by two other components of the legislation. Beginning in Fiscal Year 1983, a separate appropriation of $200 million per fiscal year was authorized specifically to address the water quality problems of marine bays and estuaries affected by discharges from combined storm water and sanitary sewer overflows. However, only ten percent of combined sewer facilities in the United States affect marine bays and estuaries (USEPA 1985, 15).[7] The EPA was also authorized to use funds from a state's regular CGP allotment for CSO construction projects, but only where the correction of CSO problems was deemed a major priority in the state's ranking system, and only if requested to do so by a state's Governor (33 U.S.C. 1285, Section 201(n)).

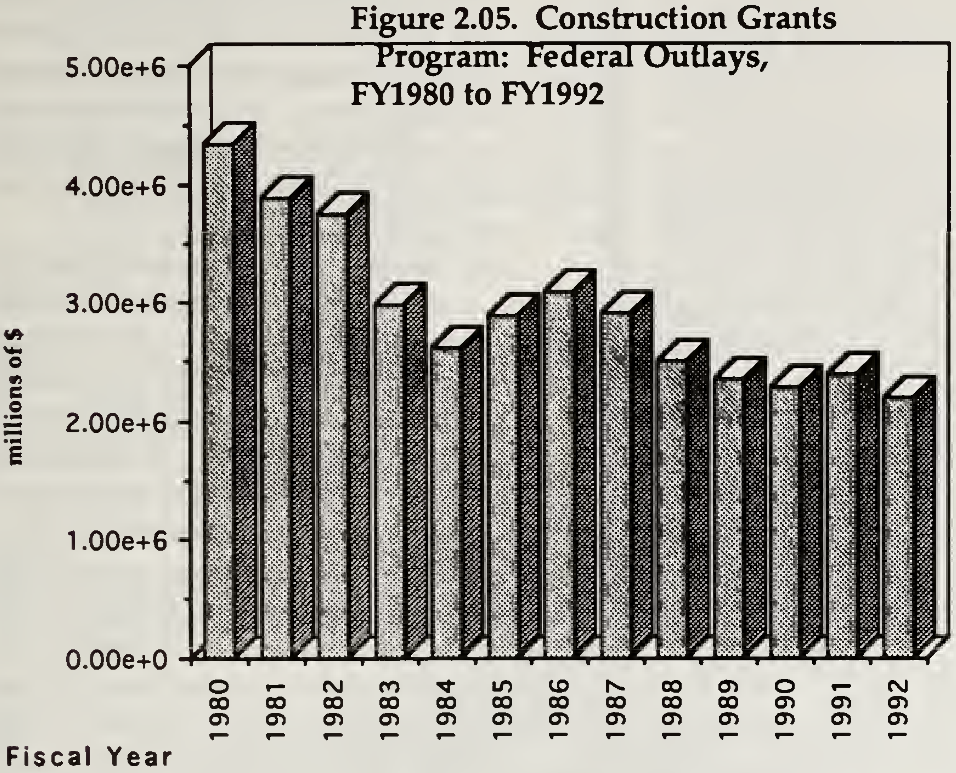


Figure 2.05. Construction Grants Program: Federal Outlays, FY1980 to FY1992

Second, and most importantly, the Construction Grant Amendments of 1981 reduced the federal contribution for the construction of publicly owned treatment works from seventy-five percent to fifty-five percent of construction costs.[8] In addition, the 1981 Amendments lowered the annual authorizations for the Construction Grants Program and, accordingly, federal outlays for the construction of POTWs began a steady decline that has continued unabated for the last thirteen years, even though the original water quality goals and mandates remain the same as in the 1970s (See Figure 2.05).

The U.S. Congress clearly understood that the sharp and protracted decline in federal assistance initiated by the 1981 Amendments would create difficulties for municipalities currently or potentially subject to federal court orders. Section 26 of the 1981 Amendments declared "the sense of the Congress that judicial notice should be taken of this Act and of the amendments to the Federal Water Pollution Control Act made by this Act, *including reduced authorization levels* under section 207 of such Act."[9] While such decisions remain within the discretion of individual judges and courts, it was unquestionably the intent of Congress that the judiciary should take special notice of the hardship created for municipalities by reduced federal funding. Consequently, Section 26 of the 1981 Amendments directs:

> "that the parties to Federal consent decrees establishing a deadline, schedule, or timetable for the construction of publicly owned treatment works are encouraged to reexamine the provisions of such consent decrees and, *where required by equity*, to make appropriate adjustments in such provisions."[10]

Importantly, even when federal funding levels were at their peak for the Construction Grants Program, EPA needs assessments indicated that "the construction grant monies allocated to each region and state have never been sufficient to cover every proposed project" even though "few sewage facilities can be constructed without federal assistance" (Walton and Hathaway 1979, 31). Nevertheless, in its first year (FY 1981), the Construction Grant Amendments reduced the CGP spending authorization to $3.9 billion. During the time span covered by the Construction Grant Amendments, spending authorizations fell steadily to $2.9 billion in FY 1988 (MacAuley and Mathieu 1987, 13). Overall, federal construction-related **expenditures for sewage treatment facilities dropped by forty-eight percent**, in constant dollars, from 1980 to 1988 (Ibid., 3, 13). Significantly, according to EPA needs assessments, **CSO projects constitute the largest unmet need in the federal Construction Grants Program** (USEPA 1985). The U.S. Environmental Protection Agency's most conservative estimate is that CSO control will require more than $23 billion in capital expenditures to reach the goals established by the Clean Water Act (USEPA 1983).

Nevertheless, the erosion of federal support for the construction of publicly owned treatment works continued with the Water Quality Act of 1987. The federal spending authorization for construction of publicly owned treatment works was reduced by another seventy-five percent from $2.4 billion in Fiscal Year 1988 to only $600 million in Fiscal Year 1994. The Water Quality Act attempts to partially offset the effect of these reductions on municipalities by mandating increased state contributions to the construction of treatment facilities.

The Water Quality Act of 1987 implements the state mandate by requiring the states to create "State Water Pollution Control Revolving Funds" (SRF) by September 30, 1989. The Water Quality Act authorizes annual federal appropriations to the SRFs. Each state's allotment of the federal appropriation is defined as a fixed percentage of the total annual appropriation for all SRFs. However, in order to receive its federal allotment, each state must enter into a binding Capitalization Grant Agreement with the U.S. Environmental Protection Agency. These agreements require a state to match every four dollars in federal allotments with one state dollar. Thus, each state is now expected annually to provide at least twenty percent of the total capitalization for its State Revolving Fund. The state must make its contribution to the SRF, in quarterly installments, on or before the date of the federal contribution.

The State Revolving Funds are designed to create a self-perpetuating source of funds for capitalizing the construction of water pollution control projects, especially publicly owned treatment works and combined sewer overflow abatement projects. Yet, in contrast to the earlier Construction Grants Program, the SRFs are only authorized to make loans to municipalities at below market to zero interest rates. Loan recipients are required to establish a dedicated source of revenue for repayment of the loan. Annual principal and interest payments must commence no later than one year after completion of the project and must be fully amortized not later than twenty years after completion of the project.

The Commonwealth's SRF is known as the Massachusetts Water Pollution Abatement Trust (MWPAT). It is the main source of financial assistance in Massachusetts for CSO abatement and for other water pollution control projects. Nationwide, CSO abatement has been costing from $1,300 to $2,500 per capita for households served by a combined sewer (Wordelman 1991; Oakley and Foster 1989). Estimates based on these averages predict that CSO abatement in Massachusetts will require from $2.5 billion to $4.9 billion in capital outlays over the next fifteen years. It is virtually certain that actual costs for CSO abatement in Massachusetts will tend toward the high end of this range. Three CSO projects serving eleven of the twenty-six affected communities in the state already have a known cost of more than $2 billion (i.e., Boston/MWRA at $1.6 billion, Lower Connecticut

A Brief History of Clean Water Legislation

1948	Federal Water Pollution Control Act Mandated primary treatment and set standards for sewage discharge.
1972	Federal Water Pollution Control Act Amendments Mandated secondary treatment. Raised sewage discharge standards. Created Construction Grants Program with 75% federal grant assistance for treatment plants. Created NPDES Permitting Program Standards
1977	Clean Water Act of 1977 (further amendment of the Federal Water Pollution Control Act) Reauthorized Construction Grants Program. Mandated EPA *reports* on status of CSOs.
1981	Municipal Wastewater Treatment Construction Grant Amendments. Reduced from 75% to 55% federal matchin grants. Mandated that 80% of Construction Grants be set aside for secondary treatment plants. Authorized $200 million/year for CSOs discharging into marine bays or estuaries (discontinued 1987).
1987	Water Quality Act of 1987 (further amendment of the Federal Water Pollution Control Act) Defined CSOs as point-source discharges to bring them under the NPDES. Provided for EPA *oversight* of CSOs. Phased out Construction Grants Program and substituted SRF effective 1989; SRF loans replace federal grants.
1989	Massachusetts Ch. 275 created the Massachusetts Water Pollution Abatement Trust (the SRF for Mass.) Provided 45% grant equivalency loans with capitalization provided 80% by federal and 20% by state governments.
1992	Massachusetts Ch. 203 reduced grant equivalency to 25%. Allowed leveraging in issuance of bonds due to decreases in federalappropriations to SRFs.
1994	Pending reauthorization and amendment of the Federal Water Pollution Control Act.

River Valley at $350 million, and Fall River at $130 million). Thus, to meet the timetable established by the state's CSO Control Strategy, the MWPAT would need to advance approximately $300 million annually in capital outlays simply to address the state's CSO problem.

Yet, during the last four years, the MWPAT has received state and federal capitalization funds sufficient only to issue a total of $120 million in loans. The MWPAT's Financial Plan predicts that $640 million in new projects will be funded during the next few years, but approximately one-half of that sum will be allocated to the Massachusetts Water Resources Authority for the Boston Harbor clean-up and to the City of New Bedford for the construction of a secondary treatment facility. It is beyond doubt that the current and anticipated resources of the MWPAT are simply inadequate to meet CSO water quality mandates within a fifteen-year timeframe, particularly since secondary treatment remains a higher level priority in the competition for limited funds.

Fall River's CSO Problem

The history of wastewater treatment in Fall River closely parallels national patterns of development. The original sewer system in Fall River, Massachusetts was designed and constructed in the period from 1820 to 1850. For the most part, the present combined sewer system was developed from 1910 to 1930. As with all combined sewers, the system's main purpose was to collect sewage from residences and businesses and to receive stormwater runoff from the streets during periods of wet weather in order to prevent flooding (Maguire Group 1992, Vol. 3, I-2). Consequently, until 1952, the system's untreated sewage and stormwater runoff were discharged directly into Mount Hope Bay, the Quequechan River, and the Taunton River.

The first major improvements to the Fall River combined sewer system were adopted in response to federal mandates contained in the U.S. Public Health Act and the Federal Water Pollution Control Act of 1948. From 1948 to 1952, Fall River constructed a publicly owned primary wastewater treatment plant. The facility provided primary treatment for normal dry weather sewer flows and then discharged the treated effluents into Mount Hope Bay. As part of the upgrade to primary treatment, the City constructed several regulator chambers and interceptors to divert dry weather flows to the primary treatment facility. The City's primary treatment facility received additional upgrades in 1961 and 1971.

In response to the mandates of the Federal Water Pollution Control Act Amendments of 1972, the City initiated the design and planning of a secondary wastewater treatment facility. The secondary treatment facility was constructed from 1979 to 1981. Seventy-five percent of the project's $36 million cost was defrayed by the EPA's Construction Grants Program. An additional fifteen percent of the cost was defrayed by state assistance so Fall River was required to absorb only ten percent of the secondary treatment facility's construction costs. During the last decade, the City also implemented an Industrial Pretreatment Program (Maguire Group 1992, Vol. 3, I-2-3). This series of continuous improvements to the City's sewer resulted in a system that complied with the original water quality standards established under the Clean Water Act of 1977. The City's most recent environmental study indicates that, under dry weather conditions, discharges from the City's sewer system no longer disturb water quality sufficiently to affect the normal life of receiving waters.

However, because the Water Quality Act of 1987 defined combined sewer overflows as point sources of pollution, the City responded to changing federal policy by commissioning a Phase I CSO Facilities Plan. The Phase I CSO Facilities Plan was completed by the Maguire Group, Inc. in November 1987. As a result of findings reported in the Phase I Plan, Fall River implemented a $12 million rehabilitation of its combined sewer to reduce infiltration inflows to the system. The City also instituted new collection system controls that include the routine cleaning of sewer lines to reduce backpressure and the addition of weirs into the CSO structures to prevent CSOs during low flow periods. These improvements have virtually eliminated dry weather CSOs and have limited CSO discharges during periods of light rainfall (Maguire 1992, Vol. 3, II-16).

Yet, during moderate to heavy rainfall events, excess flows continue to build up in the combined sewer and discharge untreated into receiving waters. Currently, the City's combined sewer has nineteen outfall points that discharge into Mt. Hope Bay (13), the Quechechan River (4), and the Taunton River (2) (see Figure 2.06). The nineteen outfalls are estimated to contribute about 941 million gallons per year of untreated wastewater into the receiving waters (Maguire Group 1992, Vol. 3, I-1). Fecal coliform is the main pollutant discharged during Fall River's combined sewer overflows. The most recent study of the CSOs environmental impact indicates that after a combined sewer overflow fecal coliform levels in Mount Hope Bay return to pre-storm levels within one to two days (Maguire Group 1992, Vol. 3, II-16-20).

Nevertheless, once the U.S. Environmental Protection Agency released its Combined Sewer Overflow Control Strategy in August 1989, the official change in administrative policy placed the City in violation of its NPDES permit due to the combined sewer overflows that occur during wet weather. Consequently, on September 29, 1989, the EPA issued an Administrative Order to the City of Fall River based on violations of the City's NPDES Permit (No. MA0100382). The order cited the discharge of untreated storm and sanitary wastewater from the nineteen combined sewer outfalls as a violation of the NPDES permit. The Administrative Order required the City to submit a Phase II draft CSO Facilities Plan to the EPA and to the Massachusetts Department of Environmental Protection (MDEP) by November 1, 1990. The Phase II Plan was required to assess alternative solutions to the Fall River CSO problem and to recommend a solution in conformity with EPA and MDEP planning guidelines (Maguire Group 1992, Vol. 3, ii).

The City complied with the EPA Administrative Order in a timely manner. Phase II Planning resulted in a recommendation by the Maguire Group, Inc. that Fall River construct an off-line deep tunnel storage facility. The recommendation was to bore a 4.6 miles of 18-foot diameter tunnel 150 feet below ground (See Figure 2.07). The proposed tunnel would have a storage capacity of 48.3 million gallons. During periods of rainfall, excess combined sewer flows would be routed into the deep tunnel and stored so that combined flows neither overload the treatment facility or discharge into receiving waters. Once rainfalls terminate and flow levels to the treatment facility abate, excess wastewater stored in the deep tunnel can then be pumped to the publicly owned treatment works where it receives primary and secondary treatment. The deep tunnel storage alternative proposed for Fall River will not entirely eliminate combined sewer overflows, but it will reduce the number of CSOs to four per year. This level of CSO abatement is sufficient to comply with the EPA's CSO control policy and with the Massachusetts Department of Environmental Protection's Combined Sewer Overflow Strategy (Comm. of Mass. 1990).

In the meantime, the City of Fall River also has been sued by the New England Conservation Law Foundation, Inc. under the provisions of the Clean Water Act. The U.S. District Court, District of Massachusetts, issued an enforcement order on March 11, 1992 that dictated a planning and construction timetable for a CSO facility in Fall River (See Table 2.01). The court's timetable is consistent with the schedule for statewide CSO control established by the Massachusetts Department of Environmental Protection (Comm. of Mass. 1990). Unfortunately, the court's enforcement order for the Fall River CSO project has been issued at a time of considerable fiscal uncertainty.

Table 2.01. Major Deadlines for Completing the Fall River CSO Facility

Action	Deadline
1. *Enforcement Order Issued* Compliance: Civil Action No. 87-3067-Z	**March 11, 1992**
2. *Submit Proposed Final CSO Facilities Plan* Compliance: Submitted	**June 11, 1992**
3. *File EIR/EIS(s)* Compliance: To be submitted 12/31/93	**March 11, 1993**
4. *Award Contract(s) for System & Tunnel Design*	**March 11, 1993** (Or withinin two months from the date of the certificate of the Secretary of EOEA on a final EIR.)
5. *Completed Design for Storage Tunnel*	**April 11, 1995** (Or twenty-five months from the date of the certificate of the Secretary of EOEA on a final EIR.)
6. *Completed Design for CSO Treatment Facility, Pumping Facility, etc.*	**March 11, 1996** (Or thirty-six months from the date of the certificate of the Secretary of EOEA on a final EIR.)
7. *Complete Construction, Commence Operation of Facility*	**June 11, 1999** (Or seventy-six months from the date of the certificate of the Secretary of EOEA on a final EIR.)

Figure 2.06. Fall River Sewer Outfalls
Source: Maguire Group Inc., City of Fall River CSO Phase II Facilities Plan: Final CSO Facilities Plan, Vol. I

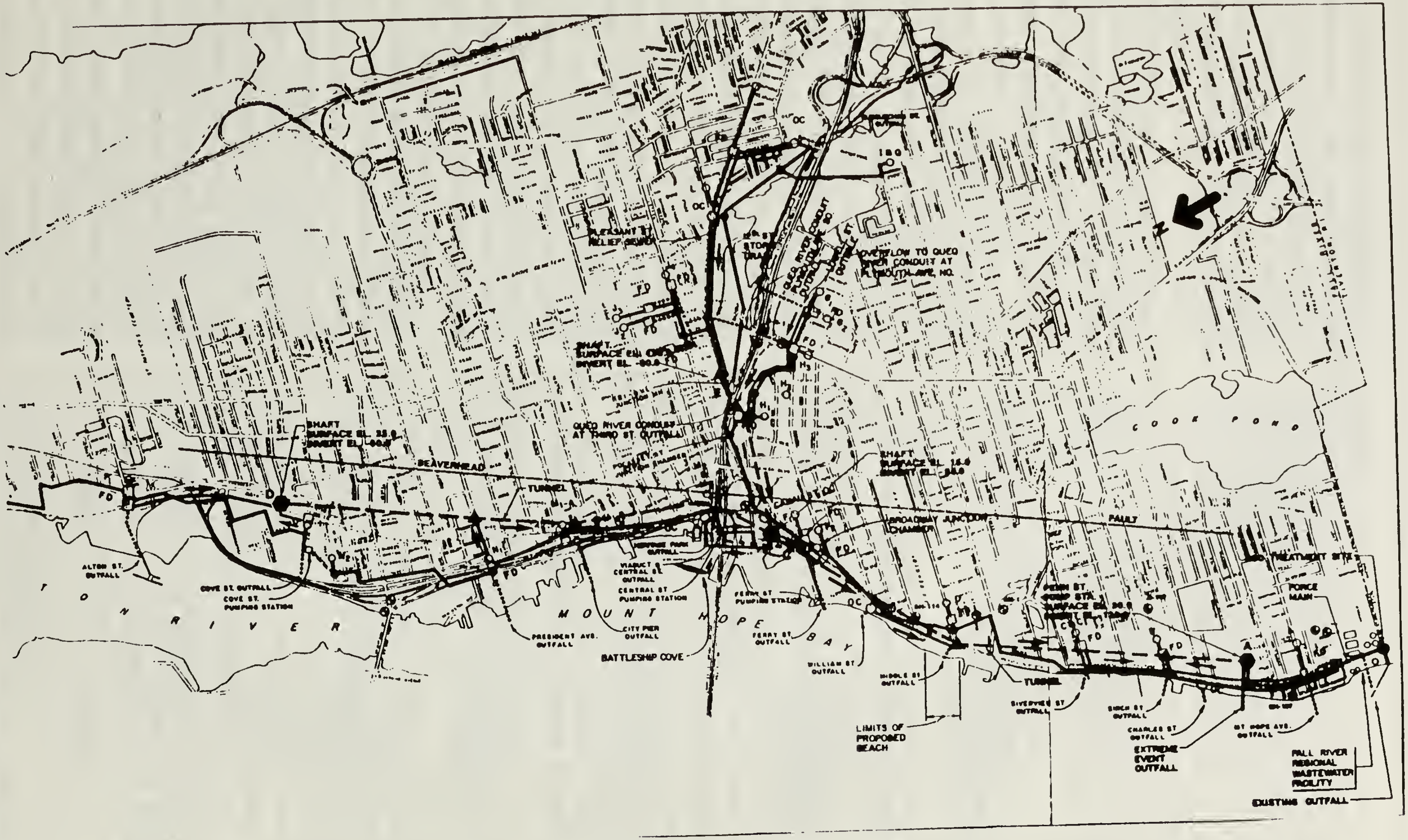
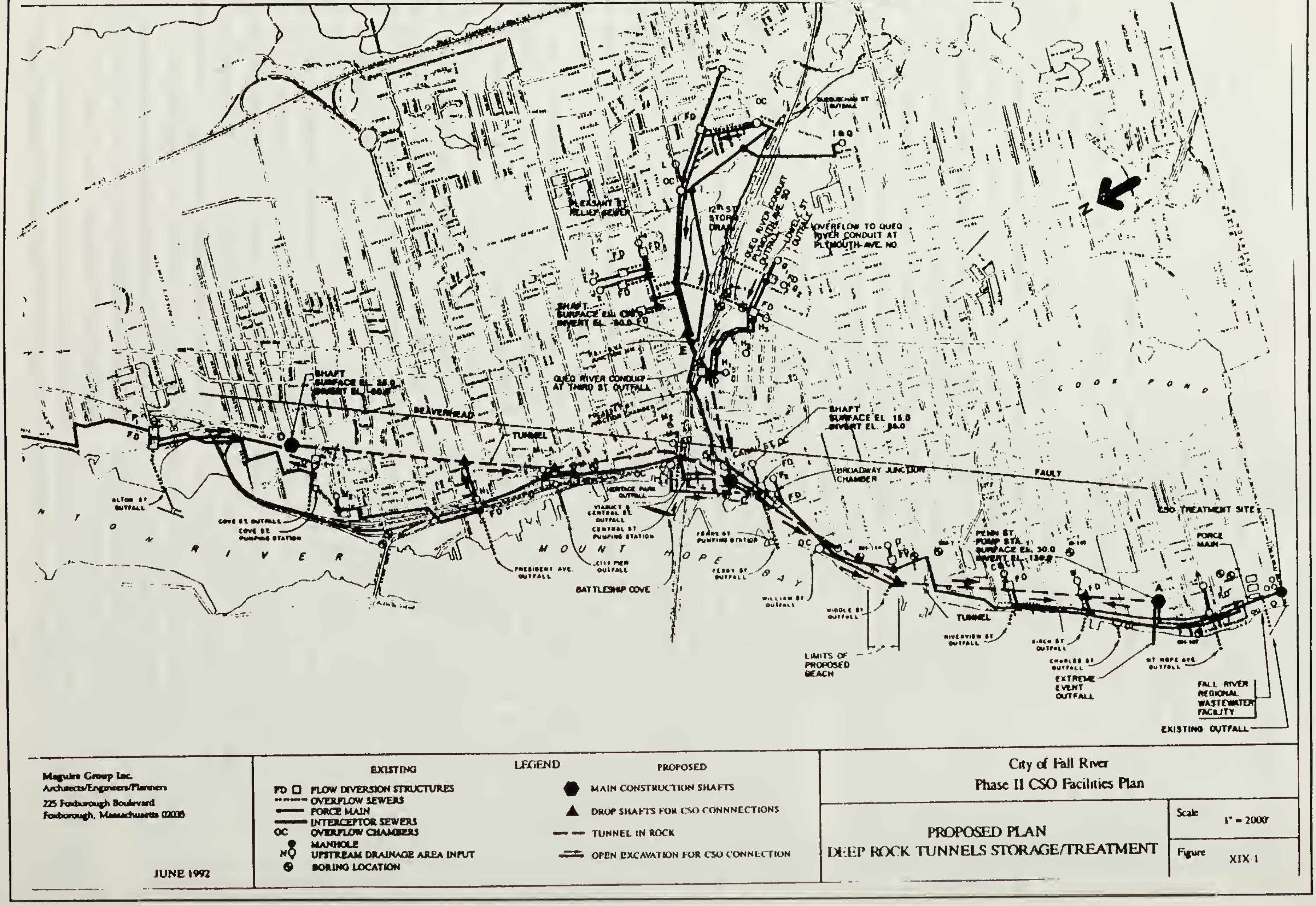


Figure 2.07. Proposed Deep Tunnel Storage Network Source: Maguire Group Inc., City of Fall River CSO Phase II Facilities Plan:Final CSO Facilities Plan, Vol. I



Funding CSO Abatement in Fall River

The City's engineering consultant, Maguire Group, Inc., estimates that the total capital cost of the proposed deep tunnel storage facility will be $130 million. This mandated cost comes at a time when Fall River remains in a chronic condition of economic and fiscal distress (see Economic Base Study in Chapter 4 and Fiscal Capacities Analysis in Chapter 3 below). The expectations for federal and state assistance are both diminished and uncertain.

Federal assistance for wastewater construction projects has been declining for more than a decade and current authorizations for spending under the Water Quality Act indicate that this trend will continue at least through federal Fiscal Year 1994. Meanwhile, the Clean Water Act is subject to reauthorization and amendment within the next six to twelve months and the outcome of those deliberations is not subject to prediction. At the same time, state finances in Massachusetts have yet to emerge from a severe fiscal crisis that began in 1989 (MTF 1991; Slavet and Torto 1991; Slavet, Torto, Beard, and DiNatale 1990). Recent analyses by state legislative budget officers and others project that state finances will remain structurally unbalanced at least through the mid-1990s (Commonwealth of Massachusetts 1993c; Slavet and Barresi 1993). Finally, the Construction Grants Program has undergone a major redesign with the creation of the State Revolving Funds and, in particular, the financial capacities of the Massachusetts Water Pollution Abatement Trust are simply inadequate to finance the many water pollution abatement projects in need of funding.

As already noted, the passage of the Water Quality Act of 1987 phased out the Construction Grants Program by shifting the main responsibility for adminstering wastewater treatment funds from the U.S. Environmental Protection Agency to the State Revolving Funds. In 1989, the Commonwealth of Massachusetts complied with the requirements of the Water Quality Act by creating a State Revolving Fund under Chapter 275 of the Massachusetts General Laws.

The state's original SRF guidelines established 45% grant equivalency awards for municipal water pollution abatement projects entered on the DEP's state Priority List. A 45% grant equivalency is achieved by advancing the full capital cost of a project as a loan to the municipality. Interest payments on the loan are heavily subsidized from an equity fund controlled by the MWPAT and are further defrayed by annual payments made to the MWPAT by the state legislature on behalf of the particular city. The effect of these subsidies is that a 45% grant equivalency award appears to the recipient as if it was a loan amortized at approximately three percent simple interest. The loan repayment schedule requires that principal and interest be repaid over twenty years in forty bi-annual installments with the amount of each payment increasing over the duration of the loan. Repayment of MWPAT loans does not begin until one year after the completion of a construction project. Under the timetable established for Fall River by the federal court's enforcement order, repayment of an SRF loan would not begin until the year 2001.

Furthermore, the Massachusetts DEP's original policy intent was to provide 75% grant equivalency awards for Priority-Listed projects in "hardship communities." A 75% grant equivalency is achieved by first advancing the full capital cost of a project to the eligible municipality. The MWPAT raises the grant equivalency from 45% to 75% by forgiving 25% of the loan, effectively writing off this portion of the principal. The remaining principal is repaid at near 0% subsidized simple interest. The loan repayment schedule is the same as a 45% grant equivalency award. When Phase I Planning of Fall River's CSO project was approved for SRF funding in 1983, it actually received a 90% grant equivalency award as a hardship community. Thus, as the project developed over the following decade, it was widely expected by city officials, business leaders, and citizens that the remainder of the project - Phase II Design and Phase III Construction - would continue to qualify for at least a 75% grant equivalency award.

The original design and program guidelines for the State Revolving Fund were premised on fiscal conditions that ceased to exist soon after the program's start-up in 1989. As the state's fiscal condition failed to improve significantly, the MWPAT guidelines were amended in 1992 to reduce the grant equivalency awards available to the state's municipalities for water pollution abatement. The category for hardship communities has been abolished so that Fall River will clearly not qualify for a 75% grant equivalency award.[11] Furthermore, projects are eligible for a 45% grant equivalency award only if they were placed on the state's Priority List prior to 1992. Thus, Phase II Design costs for Fall River's CSO project *may qualify* for 45% grant equivalency assistance but, given other changes to the MWPAT guidelines, it is quite definite that Fall River will not receive a similar equivalency for the more costly Phase III Construction.

The Chapter 205 amendments reduce MWPAT loans from 45% to 25% grant equivalency for projects placed on the state's Priority List in 1992 or afterwards. A 25% grant equivalency is achieved by decreasing the interest rate subsidies charged on MWPAT loans from approximately three percent to a rate pegged at one-half of the current market rate for MWPAT bond issues (i.e. 2.7% to 3.0%). The effect of the reduced subsidy is that a 25% grant equivalency appears to the municipality as if it was a loan at approximately 6.25% simple interest. Since the actual construction phase of Fall River's CSO project is not scheduled to begin until 1996, Fall River's CSO Project may qualify for a 25% grant equivalency award.

By statute, a 25% grant equivalency is the maximum assistance that the City of Fall River can receive from the MWPAT. As part of this study, the DEP's Trust Administrator was interviewed on two occasions (6-30-93 and 7-1-93). He emphasized that there was no guarantee that Fall River's CSO project would be funded either in part or in its entirety. It was pointed out that MWPAT's fiscal capacities are under stress, primarily due to two projects. First, a court order requires the MWPAT to provide 65% in direct subsidies for construction of the New Bedford secondary waste treatment facility which is a $250 million project. In addition, the MWPAT is committed to the construction of a secondary treatment facility for the South Essex Sewer District. All things remaining the same, these two projects will leave MWPAT will little room to absorb more large projects in the near to intermediate future.

Consequently, as Fall River's CSO project develops through its various phases, federal and state financial assistance has steadily withered away. A CSO project becomes more costly in each succeeding stage as it moves from Phase I Planning to Phase II Design to Phase III Construction. In moving through each of these phases, the City of Fall River has encountered a steady decline in assistance from 90% grant equivalency for the least expensive phase of the project, to a likely 45% grant equivalency for the slightly more expensive Phase II Design, to a 25% grant equivalency for construction of the CSO facility. Yet, despite uncertain and rapidly deteriorating financing options, the City remains obligated to move forward on the CSO project on a strict and inflexible timetable established by the District Court's enforcement order.

Notes

[1] The resuspension of dry weather sediments is an inherent characteristic of combined sewers because they are sized for a wide range of flow rates and are therefore not designed to maintain a self-cleansing velocity during low-flow dry weather periods.

[2] A leading national study detected forty-six priority toxic pollutants in CSO discharges throughout the United States. Zinc, nickel, lead, copper, and chromium were the toxic elements present in the highest average concentrations; trichloroethene, methylene chloride, tetrachloroethene, 1,1,1-trichlorethane, and toluene were the organic pollutants detected in the highest average concentration (Crawford and Goodwin 1984). E-coli bacteria are routinely encountered in CSO discharges.

[3] See, Environmental Protection Agency, Effluent Guidelines and Standards, 40 CFR, Part 401-460 for individual point source category permitting regulations.

[4] See (USEPA 1978) for this report.

[5] The policy states that "CSO point sources currently discharging without a permit are unlawful and must be permitted or eliminated."

[6] Municipalities that violate NPDES permits are potentially liable for civil penalties of up to $25,000 per day for each violation. The EPA is also authorized to impose administrative penalties of up to $125,000.

7 It should be noted that CSO facilities affecting marine bays and estuaries account for about forty percent of the total assessed dollar needs attached to CSO correction and account for about thirty-eight percent of the total population served by combined sewers (USEPA 1985, 15).

[8] The 1981 Amendments do allow up to 10% of each state's regular CGP allotment to be advanced to potential grant applicants to cover the costs of facility planning or the preparation of plans, specifications, and estimates.

[9] Italics added by authors for emphasis.

[10] Italics added by authors for emphasis.

[11] Projects placed on the state's Priority List prior to 1989 are still eligible for 75% grant equivalency awards under the Massachusetts Water Pollution Abatement Trust Commonwealth Fund.

Chapter 3

FISCAL CAPACITY ANALYSIS: FINANCING THE FALL RIVER CSO PROJECT

The are no absolute measures of municipal fiscal capacity. Thus, determinations of how much citizens can "afford" to pay for public services and infrastructure is frequently a highly political judgment. The fiscal capacity of any governmental unit depends on the willingness or unwillingness of citizens and businesses to bear the burden of additional taxation or user fees. The willingness to bear this burden is heavily dependent on community values, the tax tolerance of local residents, and often on how particular projects or services fit within a community's larger sense of collective priorities. It is not uncommon for the decisions of one community to be quite different from those of a nearby community or, in many cases, to be in conflict with other levels of government that seek to impose mandated costs of one type or another.

However, notwitstanding this caveat, there are generally accepted standards in the fields of public finance and political economy for comparing the *fiscal capacity* and *fiscal effort* of governmental bodies (Mass. Taxpayers Foundation 1992). Measurements of fiscal capacity and fiscal effort can define a statistically normal range for comparing the revenues, expenditures, and indebtedness of similar units of government. Projections based on such data can be used to inform judgments about whether particular services or projects are affordable within the normal range of financial operations established by comparable units of government.

Definitions, Data, and Method

Fiscal capacity refers to the relative tax and fee base available to a particular unit of government in comparison to similar units of governments. Fiscal capacity is commonly measured by constructing a fiscal capacity index. A fiscal capacity index measures the size of the per capita revenue base available to a particular unit of government relative to the average revenue base available to comparable units of government. In this study, various fiscal capacity indices have been constructed for the 351 municipalities in Massachusetts by dividing the per capita revenue base of each town and city by the Massachusetts state average.[1] A municipality's rank in the ordering of fiscal capacity indices projects where a municipality's revenues per capita would rank *if* every municipality used average rates of taxation and applied those rates to the average revenue base. A rating of 100 indicates that a municipality has an average fiscal capacity compared to other cities and towns in Massachusetts. A rating above 100 indicates that a municipality has a higher than average fiscal capacity for the state, while a rating below 100 indicates that the municipality has a below average fiscal capacity for the state.

A municipality's fiscal capacity is ultimately dependent on two factors. First, property taxes constitute the main own-source revenue for municipalities throughout the United States, including those in Massachusetts.[2] Consequently, the assessed valuation of real property within a municipality's boundaries will be a major factor that either enhances or limits its fiscal capacity. Second, the median household income of a municipality's residents is also an important factor, since it determines their "ability to pay" property taxes and user fees. Median household income adds a particularly important balance to the assessment of municipal fiscal capacities, because property-values often inflate faster than median incomes, while property taxes and local user fees are highly regressive by nature (McIntyre et al., 1992).

On the other hand, measurements of *fiscal effort* illustrate how intensively a particular unit of government utilizes its tax and fee base relative to comparable units of government. A governmental unit's fiscal effort is measured by constructing a fiscal effort index. A fiscal effort index measures the ratio of own-source revenue collections by a particular unit of government to similar units of government. In this respect, fiscal effort indices provide a mechanism for determining how heavily citizens are burdened by revenue collections in comparison to the citizens of comparable governmental units.

The most widely accepted measures of fiscal effort are revenue per capita and the ratio of own-source revenues collected to median household income. For the purpose of assessing municipal fiscal effort, the ratio of own-source revenues collected to assessed property values is also an important measurement of fiscal effort. Comparisons of revenue per capita are useful for certain purposes, but ratios are generally considered more meaningful because they measure the proportion of income and property wealth extracted for municipal operations. For instance, a municipality with comparatively high per capita revenues might generate those revenues with a relatively low fiscal effort, if it is an exceptionally wealthy community. By the same token, a municipality with comparatively low per capita revenues could still be making a relatively strong fiscal effort, if it is an exceptionally poor community.

For purposes of comparison, various fiscal effort indices have also been constructed for the 351 municipalities in Massachusetts. Once again, an index rating of 100 indicates that a municipality is making an average fiscal effort compared to other cities and towns in Massachusetts. A rating above 100 indicates that a municipality is making a higher than average fiscal effort for the state, while a rating below 100 indicates that the municipality is making a below average fiscal effort for the state.

Finally, a governmental unit's debt load and bond rating also provide additional measures of fiscal capacity and fiscal effort. Municipalities usually incur long-term indebtedness through the issuance of general obligation bonds. General obligation bonds pledge a municipality's general revenue fund (i.e., its fiscal capacity) toward the repayment of principal and interest on bonds. The municipal bonds of most municipalities in Massachusetts are rated by Moody's Investors Service with a simple system of lettered gradations ranging from a high of "Aaa" to a low of "C". The purpose of these ratings is to provide potential investors with a comparative assessment of bond quality. Municipal bonds with lower ratings are considered riskier investments, are considered less certain of repayment and, therefore, carry a higher interest rate (Moody's 1993, 367). Numerous factors are considered when issuing a bond rating, but the ratios of total outstanding indebtedness and a municipality's fiscal capacity are certainly among the most important ones.

A municipality's existing debt burden is measured in several ways. The most easily understood measurement is the total outstanding debt per capita. However, a municipality's debt load is best measured by determining the ratio of total outstanding debt to a municipality's total household income or by the ratio of total outstanding debt to a municipality's total assessed property values. Many states, including Massachusetts, impose a debt ceiling defined in terms of the latter ratio. The Massachusetts General Laws, Chapter 44, section 10 state that "a city shall not authorize indebtedness to an amount exceeding two and one half percent, and a town shall not authorize indebtedness to an amount exceeding five percent, of the equalized valuation of said city or town" (Comm. of Mass. 1993). In response to special or emergency conditions, these debt ceilings can be doubled for both cities and towns.

The measurements of fiscal capacity, fiscal effort, and bonded indebtedness in this study rely on two sources of data. First, the Massachusetts Department of Revenue (DOR) maintains an extensive Municipal Data Bank with direct on-line computer accessibility. At the time of this study, there is complete or nearly-complete data for all 351 municipalities through Fiscal Year 1992. The DOR Municipal Data Bank is the source for all data concerning municipal revenues, assessed property values, tax rates, bond ratings, and total outstanding municipal debt. All data related to population and income for Massachusetts towns and cities are taken from the 1990 United States Census.

Fiscal Capacity Analysis

The Structure of Municipal Finance in Massachusetts

This section of the study will utilize the standard measures described above to make a base-line assessment of Fall River's existing fiscal capacity, its own-source revenue effort, and its relative debt load. The base-line comparisons will make it possible to assess the fiscal impact on Fall River of various combined sewer overflow finance scenarios. Consequently, by projecting the various finance scenarios against the base-line data it becomes possible to make an informed judgment as to whether Fall River can in fact afford the CSO project with a reasonable fiscal effort.

The sources of municipal revenue in Massachusetts are classified under four major headings by the state Department of Revenue: tax levy, state aid, local receipts, and other. Table 3.01 shows the average proportion of municipal revenue derived from each source in FY 1992, while Appendix A in Volume II provides the same data for each of the 351 municipalities in Massachusetts. As Table 3.01 indicates, municipal tax levies on residential, open space, commercial, industrial, and personal property provide more than half (52.4%) of all municipal revenue in Massachusetts. Local receipts from water, sewer, and garbage collection fees, as well as motor vehicle excise taxes and investment income, provide another 21.3% of municipal revenue. Using the DOR's classification, we have defined "municipal own-source revenues" as tax levies plus local receipts. Statewide, municipal own-source revenues account for almost three-quarters (73.7%) of all revenues collected by Massachusetts municipalities in FY 1992. State aid is distributed to municipalities according to a formula that is heavily needs-based and, on average, state aid accounts for another 21.4% of all municipal revenues in Massachusetts.

Table 3.01. Sources of Municipal Revenue in Massachusetts: FY 92 Percentages.

	Tax Levy	State Aid	Local Receipts	All Other
State Avg.	52.4	21.4	21.3	4.8
Fall River	27.0	50.0	13.4	9.1

The data in Table 3.01 indicate that the structure of municipal finance in Fall River deviates substantially from the state average in two respects. First, own-source revenues account for less than half (40.4%) of municipal revenues compared to a state average of 73.7%. Second, Fall River derives one-half of its municipal revenues from state aid or more than double the 21.4% state average. Because the distribution formula used to allocate state aid is heavily weighted towards needs-based criteria, Fall River's dependence on state aid would suggest a low own-source fiscal capacity.

Fiscal Capacity Analysis: A Summary of Findings

Five fiscal capacity indices were constructed for the 351 municipalities in Massachusetts in order to test this hypothesis. The indices were constructed from the following data:

(1) total assessed property values per capita,

(2) total assessed commercial and industrial property values per capita,

(3) total assessed residential property values per capita,

(4) per capita income,

(5) median household income.

The five fiscal capacity indices constructed for this analysis show that **the City of Fall River has an exceptionally weak fiscal capacity. In fact, its fiscal capacity rates among the lowest of any municipality in Massachusetts.**

Total Assessed Property Values Per Capita: As already noted, property tax levies are the primary own-source revenue for municipalities in the Commonwealth of Massachusetts. The total assessed property values per capita and the complete fiscal capacity index constructed from that data are presented in Volume II as Appendix B. Table 3.02 summarizes the range of that data by comparing the average total assessed property values per capita for all Massachusetts municipalities, the high and low ends of the range, and the comparable data for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.02.

In FY 1992, the average total assessed property values per capita were $62,564 for the state's 351 municipalities.[3] **Fall River ranked 347th in terms of total assessed property values per capita.** The fiscal capacity index constructed from this data indicates that **Fall River's equalized property tax base is less than half (49%) of the state average** for municipalities in Massachusetts.

Commercial and Industrial Property Values Per Capita: The total assessed property values of a municipality consist mainly of commercial, industrial, and residential properties. Moreover, commercial and industrial properties are generally taxed at higher rates than residential property. Thus, for the purpose of measuring a municipality's capacity to levy property taxes, it is often useful to construct separate indices for business and residential property.

The assessed commercial property values per capita and the assessed industrial property values per capita are presented in Volume II as Appendix C. The complete fiscal capacity indices constructed from those data are presented in Volume II as Appendix D. Tables 3.03 and 3.04 summarize the range of that data by comparing the average assessed commercial property

Table 3.02. Fall River Fiscal Capacity Index: Total Assessed Property Values Per Capita, FY 1992.

Municipality	TAVPC	Rank	Index
Chilmark	$1,083,996	1	1733
State Avg.	62,564		100
Fall River	30,752	347	49
North Adams	26,189	351	42

values per capita for all Massachusetts municipalities, the average assessed industrial property values per capita for all Massachusetts municipalities, the high and low ends of each range, and the comparable data for Fall River. The index factor, in which 100 equals the state average, is also included in Tables 3.03 and 3.04.

Table 3.03. Fall River Fiscal Capacity Index: Assessed Commercial Property Values Per Capita, FY 1992.

Municipality	ACPVPC	Rank	Index
Nantucket	$50,368	1	589
State Avg.	8,548		100
Fall River	4,701	192	55
Mt. Washington	0	351	0

Table 3.04. Fall River Fiscal Capacity Index: Assessed Industrial Property Values Per Capita, FY 1992.

Municipality	AIPVPC	Rank	Index
Rowe	$69,268	1	1894
State Avg.	3,657		100
Fall River	2,422	141	66
Egremont	0	351	0

In FY 1992, the average assessed commercial property values per capita were $8,548 for the state's 351 municipalities. **Fall River ranked 192nd in terms of assessed commerical property values per capita.** The fiscal capacity index constructed from this data indicates that **Fall River's equalized commercial property tax base is only slightly more than half (55%) of the state average** for municipalities in Massachusetts. In FY 1992, the average assessed industrial property values per capita were $69,268 for the state's 351 municipalities. **Fall River ranked 141st in terms of assessed industrial property values per capita.** The fiscal capacity index constructed from this data indicates that **Fall River's equalized industrial property tax base is only two-thirds (66%) of the state average** for municipalities in Massachusetts.

Significantly, Fall River is classified as an industrial city by the Department of Revenue, but its industrial property tax capacity ranks well below comparable municipalities in the same class. Table 3.05 on the next page compares Fall River's industrial property tax capacity to other "old industrial cities." The data indicate that Fall River has among the weakest industrial property tax capacity even when compared to other relatively poor industrial communities such as Chelsea, Lowell, Holyoke, and Lawrence.

Residential Property Values Per Capita: Taxes on residential property account for approximately three-quarters of the total revenue generated by municipal property tax levies in the Commonwealth of Massachusetts. As a result, the fiscal capacity of most municipalities is heavily dependent on residential property values. The assessed residential property values per capita for the 351 municipalities in Massachusetts and the complete fiscal capacity index constructed from that data are presented in Volume II as Appendix E. Table 3.06 summarizes the range of that data by comparing the average assessed residential property values per capita for all Massachusetts municipalities, the high and low ends of the data range, and the comparable data for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.06. In FY 1992, the average assessed residential property values per capita were $48,570 for the state's 351 municipalities. **Fall River ranked 349th in terms of assessed residential property values per capita.** The fiscal capacity index constructed from this data indicates that **Fall River's equalized residential property tax base is less than than half (47%) of the state average** for municipalities in Massachusetts.

Table 3.05. Assessed Industrial Property Values Per Capita, FY 1992: Comparison of Fall River to Selected Industrial Cities.

Municipality	AIPVPC	Rank	Index
State Avg.	3,657		100
Chelsea	3,470	103	95
Lowell	3,343	106	91
Holyoke	3,139	114	86
Lawrence	2,940	121	80
New Bedford	2,476	133	68
Fall River	2,422	141	66
Brockton	2,056	159	56
Springfield	2,020	163	55

Per Capita Income: Although levies on residential property are the main source of revenue for most municipalities in Massachusetts, the income of a municipality's residents is also an important factor in measuring fiscal capacity. Income determines residents' "ability to pay" property taxes and various fees. As noted already, because property-values often inflate faster than incomes, property taxes and local user fees do not necessarily rise in tandem with property values. Indeed, indices based on assessed property values per capita may exaggerate a municipality's fiscal capacity, if property values have inflated faster than incomes for any length of time.

Per capita income data (1989) for the 351 municipalities in Massachusetts and the complete fiscal capacity index constructed from that data are presented in Volume II, Appendix F. Table 3.07 summarizes the range of that data by comparing the average per capita income for all Massachusetts municipalities, the high and low ends of the data range, and the comparable data for Fall River. The index factor, in which 100 equals the state average, is also included in Tables 3.07.

The average per capita income for residents of the state's 351 municipalities was $17,801 in 1989 (the most recent figures available from the U.S. Census). **Fall River ranked 348th in terms of the per capita income of its residents.** The fiscal capacity index constructed from this data indicates

Table 3.06. Fall River Fiscal Capacity Index: AssessedResidential Property Values Per Capita, FY 1992.

Municipality	ARPVPC	Rank	Index
Chilmark	$1,059,827	1	2,182
State Avg.	48,570		100
Fall River	22,601	349	47
North Adams	19,789	351	41

Table 3.07. Fall River Fiscal Capacity Index: 1989 Per Capita Income.

Municipality	PCI	Rank	Index
Weston	$46,855	1	263
State Avg.	17,801		100
Fall River	10,966	348	62
Lawrence	9,686	351	54

that **Fall River's per capita income is less than than two-thirds (62%) of the state average** for municipalities in Massachusetts.

Median Household Income: In an important respect, the median household income of a municipality's residents is a more accurate measure of residents' ability to pay property taxes and user fees, because per capita income figures fail to capture the distribution of income among a municipality's households. Therefore, figures on median household income can more accurately measure the financial status of the average household in a community.

Median household income data (1990) for the 351 municipalities in Massachusetts and the complete fiscal capacity index constructed from that data are also presented in Volume II, Appendix F. Table 3.08 summarizes the range of that data by comparing the median household income for all Massachusetts municipalities, the high and low ends of the data range, and the comparable data for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.08.

Median household income for residents of the state's 351 municipalities was $41,678 in 1990 (the most recent figures available from the U.S. Census). **Fall River ranked 347th in terms of the median household income of its residents.** The fiscal capacity index constructed from this data indicates that **Fall River's median household income is barely more than than half (54%) of the state average** for municipalities in Masschusetts.

Table 3.08. Fall River Fiscal Capacity Index: 1990 Median Household Income.

Municipality	MHI	Rank	Index
Weston	$95,134	1	228
State Avg.	41,678		100
Fall River	22,452	347	54
Gay Head	18,250	351	44

Summary of Fall River Fiscal Capacity Measures: The data indicate without question that Fall River has one of the weakest property and income bases of any municipality in the Commonwealth of Massachusetts. Table 3.09 on the following page provides a summary of the fiscal capacity measures discussed above and, as the table reveals, Fall River consistently ranks near the bottom of most measures of municipal fiscal capacity in Massachusetts. On average, Fall River's own-source municipal fiscal capacity is roughly half the state average and, in general, it ranks below even most other old industrial cities in terms of own-source fiscal capacity.

Table 3.09. Summary of Fall River Fiscal Capacity Measures.

Fiscal Base	Rank	Index
Total Assessed Property Values Per Capita	347	49
Commercial Property Values Per Capita	192	55
Industrial Property Values Per Capita	141	66
Residential Property Values Per Capita	349	47
Per Capita Income	348	62
Median Household Income	347	54

Fiscal Effort Analysis

As discussed above, the standard measures of municipal fiscal effort consist of per capita revenue collections, the ratio of own-source revenues to median household income, and the ratio of own-source revenues to total assessed property values. Measures of fiscal effort are designed to reveal the extent to which various municipalities actually utilize their existing fiscal capacity. To make a comparative assessment of Fall River's fiscal effort, three measures of per capita revenue have been included for the 351 municipalities in Massachusetts:

(1) Total Revenues Per Capita,

(2) Tax Levy Per Capita,

(3) Local Receipts Per Capita.

In addition, five fiscal effort indices were constructed for the 351 municipalities in Massachusetts. The five indices were constructed from the following data:

(1) commercial tax rates,

(2) industrial tax rates,

(3) residential tax rates,

(4) own-source revenue effort as a ratio of total assessed property values,

(5) own-source revenue effort as a ratio of total town/city income.

Total Municipal Revenues Per Capita: The three per capita measures reveal that municipal revenues in Fall River are well below the state average, despite a heavy infusion of state aid. The data on total revenue per capita for the 351 municipalities in Massachusetts is presented in Volume II, Appendix G. Table 3.10 summarizes the range of that data by comparing the average total per capita revenue for all Massachusetts municipalities, the high and low ends of the data range, and the data for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.10.

The average total per capita revenues for the state's 351 municipalities was $1,593 in FY 1992. **Fall River ranked 220th in terms of the total per capita revenue available for municipal operations.** The comparative index constructed from this data indicates that **Fall River's total per capita revenue is only**

Table 3.10. Total Municipal Revenues
Per Capita: FY 1992.

Municipality	TPCR	Rank	Index
Gosnold	$7,424	1	466
State Avg.	1,593		100
Fall River	1,269	220	80
Phillipston	627	351	39

four-fifths (80%) of the state average for municipalities in Massachusetts.

However, even this below average figure is highly dependent upon large infusions of state aid. Own-source revenues per capita (i.e., tax levy and local receipts) are much lower than the per capita figures for total revenues. Own-source per capita revenues essentially parallel Fall River's exceptionally low ranking in the fiscal capacity measures discussed above.

Municipal Tax Levy Per Capita: The data on per capita revenues derived from municipal tax levies is provided for the 351 municipalities in Massachusetts in Volume II, Appendix H. Table 3.11 summarizes the range of that data by comparing the average per capita tax revenue for all Massachusetts municipalities, the high and low ends of the data range, and the data for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.11.

Table 3.11. Municipal Tax Levy Revenues Per Capita: FY 1992.

Municipality	TRPC	Rank	Index
Gay Head	$4,867	1	584
State Avg.	834		100
Fall River	342	347	41
Templeton	286	351	34

The average tax levy per capita for the state's 351 municipalities was $834 in FY 1992. **Fall River ranked 347th in terms of tax revenue collected per capita.** The comparative index constructed from this data indicate that **Fall River's tax revenue per capita is only two-fifths (41%) of the state average** for municipalities in Massachusetts.

Local Receipts Per Capita: The data on per capita revenues from local receipts is provided for the 351 municipalities in Massachusetts in Volume II, Appendix I. Table 3.12 summarizes the range of that data by comparing average per capita local receipts for all Massachusetts municipalities, the high and low ends of the data range, and the data for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.12.

Table 3.12. Local Receipts Per Capita: FY 1992.

Municipality	LRPC	Rank	Index
Gosnold	$2,359	1	694
State Avg.	340		100
Fall River	170	210	50
Hawley	54	351	16

The average local receipts per capita for the state's 351 municipalities was $340 in FY 1992. **Fall River ranked 210th in terms of local receipts per capita.** The comparative index constructed from this data indicate that **Fall River's local receipts per capita are only one-half (50%) of the state average** for municipalities in Massachusetts.

Fiscal Effort Indices

It has already been noted that a wealthy community with strong fiscal capacities can generate high per capita revenues with relatively weak fiscal effort, while a poor community with weak fiscal capacities may generate low per capita revenues despite a relatively strong fiscal effort. Thus, five fiscal effort indices were constructed to determine whether Fall River's low own-source per capita revenues are due to its weak own-source fiscal capacity or whether below average revenues are due to a weak fiscal effort. **The fiscal effort indices reveal that Fall River makes a very strong fiscal effort in terms of taxing commercial and industrial properties. The City makes a slightly below average fiscal effort in terms of taxing residential property and in terms of generating revenue from local receipts** (i.e., water, sewer, and garbage fees).

Tax Rates on Commercial Property: The data on tax rates for commercial property is provided for the 351 municipalities in Massachusetts in Volume II, Appendix J. Table 3.13 summarizes the range of that data by comparing the average commercial tax rate for all Massachusetts municipalities, the high and low ends of the range, and the rate for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.13.

The average tax rate on commercial property for the state's 351 municipalities was $13.77 per $1,000 assessed value in FY 1992. **The tax on commercial property in Fall River ranked 51st in the Commonwealth.** The comparative index constructed from this data indicates that **Fall River's tax rate for commercial property is 41% higher than the state average** for municipalities in Massachusetts.

Table 3.13. Tax Rates on Commercial Property: FY 1992.

Municipality	Rate	Rank	Index
Boston	$34.27	1	249
State Avg.	13.77		100
Fall River	19.47	51	141
Gosnold	2.16	350	16

Tax Rates on Industrial Property: The data on tax rates for industrial property is also provided for the 351 municipalities in Massachusetts in Volume II, Appendix J. Table 3.14 summarizes the range of that data by comparing the average industrial tax for all Massachusetts municipalities, the high and low ends of the range, and the rate for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.14.

Table 3.14. Tax Rates on Industrial Property: FY 1992.

Municipality	Rate	Rank	Index
Boston	$34.27	1	247
State Avg.	13.88		100
Fall River	19.47	51	140
Gosnold	2.16	34	16

The average tax rate on industrial property for the state's 351 municipalities was $13.88 per $1,000 assessed value in FY 1992. **The tax on industrial property in Fall River ranked 51st in the Commonwealth.** The comparative index constructed from this data indicates that **Fall River's tax rate for industrial property is 40% higher than the state average** for municipalities in Massachusetts.

Tax Rates on Residential Property: The data on tax rates for residential property is provided for the 351 municipalities in Massachusetts in Volume II, Appendix K. Table 3.15 summarizes the range of that data by comparing the average residential tax for all Massachusetts municipalities, the high and low ends of the range, and the rate for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.15.

Table 3.15. Tax Rates on Residential Property: FY 1992.

Municipality	Rate	Rank	Index
Wendel	$17.60	1	154
State Avg.	11.45		100
Fall River	8.13	316	71
Gosnold	2.16	351	19

The average tax rate on residential property for the state's 351 municipalities was $11.45 per $1,000 assessed value in FY 1992. **The tax on residential property in Fall River ranked 316th in the Commonwealth**. The comparative index constructed from this data indicates that **Fall River's tax rates on residential property are 71% of the state average** for municipalities in Massachusetts.

Table 3.16. Own-Source Fiscal Effort as a Ratio of Total Assessed Property Values, FY 92.

Municipality	Ratio	Rank	Index
Haverhill	0.037	1	196
State Avg.	0.019		100
Fall River	0.017	127	88
Chilmark	0.003	351	17

Own-Source Revenues as a Ratio of Total Assessed Property Values: As a further measure of fiscal effort, local receipts were added to municipal tax revenues in order to measure the total own-source revenue effort. The data on own-source fiscal effort as a ratio of total assessed property values is provided for the 351 municipalities in Massachusetts in Volume II, Appendix L. Table 3.16 summarizes the range of that data by comparing the average own-source ratio for all Massachusetts municipalities, the high and low ends of the range, and the ratio for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.16.

The average own-source fiscal effort as a ratio of total assessed property values was 0.019 for the state's 351 municipalities in FY 1992. The fiscal effort index constructed from this data indicates that **Fall River's own-source fiscal effort is only 88% of the state average** for municipalities in Massachusetts. However, this figure was sufficient for Fall River's **own-source fiscal effort to rank 127th in the Commonwealth**; thus, placing it in the upper half of all Massachusetts communities in terms of fiscal effort.

Own-Source Revenues as a Ratio of Total Town/City Income: The data on own-source fiscal effort as a ratio of total town/city income is provided for the 351 municipalities in Massachusetts in Volume II, Appendix M. Table 3.17 summarizes the range of that data by comparing the average own-source ratio for all Massachusetts municipalities, the high and low ends of the range, and the ratio for Fall

Table 3.17. Own-Source Fiscal Effort as a Ratio of Total Town/City Income, FY 92.

Municipality	Ratio	Rank	Index
Gay Head	0.474	1	696
State Avg.	0.068		100
Fall River	0.047	300	69
Harvard	0.029	351	42

River. The index factor, in which 100 equals the state average, is also included in Table 3.17.

The average own-source fiscal effort as a ratio of total town/city income was 0.068 for the state's 351 municipalities in FY 1992. According to this measure, **Fall River's own-source fiscal effort ranks 300th in the Commonwealth of Massachusetts**. The fiscal effort index constructed from this data indicates that **Fall River's own-source fiscal effort is only 69% of the state average** for municipalities in Massachusetts.

Summary and Analysis of Fall River's Fiscal Effort: The data concerning Fall River's fiscal effort is mixed and, therefore, may be subject to conflicting interpretations. However, on balance, the data does indicate that Fall River is making a below average fiscal effort, particularly with regard to residential tax rates. Table 3.18 offers a visual summary of the five fiscal effort indices.

Table 3.18. Summary of Fiscal Effort Indices, FY 92.

Fiscal Effort Measure	Rank	Index
Tax Rate on Commercial Property	51	141
Tax Rate on Industrial Property	51	140
Tax Rate on Residential Property	316	71
Own-Source Revenues/Total Assessed Property Values	127	88
Own-Source Revenues/Total City Income	310	69

Is Fall River Undertaxed?: The central reason for developing standardized measures of fiscal capacity and fiscal effort is to inform judgments about whether a municipality is "undertaxed" or "overtaxed" in comparison to similar municipalities. Given the mixed results of the data on Fall River, an important caveat to interpreting the data is that a below average fiscal effort does not necessarily indicate that a community is "undertaxed," nor does it necessarily imply that a municipality can absorb a substantial increase in property taxes or user fees.

The theory of progressive taxation that governs fiscal policy in all Western industrialized democracies is based on the assumption that taxpayer classes should pay taxes or other fees based on the ability to pay. Thus, the implementation of a progressive tax policy means that taxes and fees increase as a percentage of income as earnings and wealth increase. Conversely, it is expected that taxes and fees decrease as a percentage of income as earnings and wealth decrease (Lieberman 1991, 38). A progressive tax policy is based on the premise that individuals and taxpayer classes with less wealth and income also have less capacity to bear the "normal" or average tax and fee load.

Consequently, it is to be expected that a municipality such as Fall River with weak fiscal capacity and a fragile economic base would make a below average fiscal effort. This is particularly true given the fact that property taxes as the main own-source municipal revenue are acknowledged to be an inherently regressive tax (Netzer 1966). For example, the average percentage of income taken by property taxes for a Massachusetts family of four is given in Table 3.19. Table 3.19 reveals that property taxes consume approximately 6.3% of the income of the lowest income quintile in Massachusetts compared to approximately 2.5% for the top quintile. In this resepct, the regressive nature of municipal finance makes it virtually inevitable that a municipality with a comparatively low fiscal capacity will also make a

Table 3.19. Massachusetts Property Taxes as Ratio of Income for a Family of Four: 1991 Effective Rates by Income Quintiles.

Lowest	Second	Middle	Fourth	Top 20%		
20%	20%	20%	20%	Next 15%	Next 4%	Top 1%
6.3	4.2	3.9	3.6	3.5	2.5	1.4

SOURCE: McIntyre, et al., A Far Cry From Fair, p. 40.

below average fiscal effort.

From the perspective of progressive tax theory, **the crucial question is whether a municipality's relative fiscal effort is in proportion to its relative fiscal capacity.** This question is answered in Table 3.20 which compares the rankings and index ratios of Fall River's fiscal effort to its fiscal capacity. If one adopts the assumption of progressive tax theory that fiscal effort should be in proportion to fiscal capacity, then both the rankings and the index ratios for fiscal capacity and fiscal effort should be equal in Table 3.20. In those cases, where the fiscal effort ranking or index is lower than the fiscal capacity ranking or index, one may conclude that a municipality is making a comparative fiscal effort less than its comparative fiscal capacity might warrant, even when that effort ranks "above average" on a statewide basis. Similarly, in those cases, where the fiscal effort ranking or index exceeds the fiscal capacity ranking or index, one may conclude that a municipality is making a comparative fiscal effort in excess of its comparative fiscal capacity, even when that effort ranks "below average" on a statewide basis. Thus, viewed from the persepctive of progressive tax theory, the comparative data indicate that the City of Fall River is making a proportionate fiscal effort in excess of its comparative fiscal capacity. **In every instance, rankings and index ratios of fiscal effort substantially exceed the comparable ranking and index ratio for municipal fiscal capacity.**

Table 3.20. Comparison of Fiscal Effort Rankings to Fiscal Capacity Rankings.

	Ranking		Index	
	Tax Capacity	Tax Effort	Tax Capacity	Tax Effort
Total Ass'd Prop Values	347	127	49	88
Ass'd Commerical Prop	192	51	55	141
Ass'd Industrial Prop	141	51	66	140
Ass'd Residential Prop	349	316	47	71
Per Capita Income	348	310	62	69

Total Outstanding Indebtedness

Municipalities typically issue long-term general obligation bonds to finance large-scale capital improvement projects. For this reason, a municipality's ability to enter investment markets by floating general obligation bonds successfully is also an important measure of both a municipality's fiscal capacity and its fiscal effort. On the one hand, a municipality's fiscal capacity, especially its capacity to meet long-term capital needs, is greatly dependent on its ability to raise revenue by issuing general obligation bonds. On the other hand, the level of total outstanding municipal debt can also be used as a measure of fiscal effort, because it commits the residents and businesses of a municipality to a tax and fee level sufficient to meet regular bond payments.

Importantly, the balance between fiscal capacity and fiscal effort in municipal bond markets is largely determined by "outside" investment markets. The prevailing sentiment of investment markets toward a municipality's bonds can severely constrain municipal fiscal capacity through the willingness or unwillingness of investors to purchase a municipal bond issue. Investor sentiment is guided to a large extent by a municipality's bond rating which, in turn, impacts the interest rate that a municipality must pay on a particular bond issue. Depending upon the total dollar value of a particular issue, even slight differences in bond rating can save or cost a municipality millions of dollars over the twenty-year life-span of a bond issue.

Chapter 2 has already documented a strong possibility that the Fall River combined sewer overflow project will have to be financed either wholly or in part through municipal bonded indebtedness. First, the level of fiscal stress on the Massachusetts Water Pollution Abatement Trust (MWPAT) suggests that it will be impossible to fully fund all of the water pollution abatement projects deemed federally-eligible for MWPAT assistance in the next few years. Second, the fact that secondary treatment projects continue to receive a higher priority under federal and state guidelines than CSO abatement increases the probability that Fall River's CSO project will not receive even a 25% grant equivalency for the full amount of its CSO project. Thus, there is a strong possibility, and perhaps a probability, that the City of Fall River will have to finance some portion to all of its CSO project through a municipal bond issue.

Furthermore, even should MWPAT agree to finance the full amount of the Fall River CSO project with a 25% grant equivalency award, the MWPAT loan will count as part of the City's total outstanding indebtedness. Thus, even if the City is able to avoid entering the municipal bond market because of MWPAT assistance, the increased outstanding indebtedness will still impact Fall River's bond rating. Importantly, as will be documented below, the effect of the CSO project on Fall River's municipal indebtedness will negatively impact its ability to incur long-term indebtedness to meet other pressing capital needs in the City.

Some standard measures of total outstanding indebtedness are utilized to establish a comparative base line for the 351 municipalities in Massachusetts. The standard measures utilized to compare total outstanding municipal indebtedness are:

(1) total outstanding debt per capita,

(2) total outstanding debt as a ratio of total assessed property values,

(3) total outstanding debt as a ratio of total town/city income

(4) Moody's municipal bond rating.

Total Outstanding Debt Per Capita: The complete data on total outstanding debt per capita is provided for the 351 municipalities in Massachusetts in Volume II, Appendix N. Table 3.21 summarizes the range of that data by comparing the average total outstanding debt per capita for all Massachusetts municipalities, the high and low ends of the range, and the figure for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.21.

The average total outstanding indebtedness per capita was $489 for the state's 351 municipalities in FY 1992. According to this measure, Fall River's total outstanding in-

Table 3.21. Total Outstanding Debt Per Capita: FY 1992.

Municipality	Debt Per Capita	Rank	Index
Chatham	$3,897	1	796
State Avg.	489		100
Fall River	238	194	49
Acushnet	0	351	0

debtedness per capita ranks 194th in the Commonwealth of Massachusetts. The comparative index constructed from this data indicates that **Fall River's total outstanding indebtedness per capita is only 49% of the state average** for municipalities in Massachusetts.

Total Outstanding Debt as a Ratio of Total Assessed Property Values: Since property tax revenues constitute the primary own-source revenue of most towns and cities, a municipality's debt capacity is heavily dependent on its own-source fiscal capacity as measured by total assessed property values. Indeed, as noted earlier, such ratios are considered so important that most states impose municipal debt ceilings based on the ratio of total outstanding indebtedness to total assessed property values.

Table 3.22. Total Outstanding Debt as a Ratio of Total Assessed Property Values, FY 1992.

Municipality	Ratio	Rank	Index
Palmer	5.90%	1	757
State Avg.	0.78%		100
Fall River	0.77%	109	99
Acushnet	0.00%	351	0

The data on total outstanding debt as a ratio of total assessed property values is provided for the 351 municipalities in Massachusetts in Vol. II, Appendix O. Table 3.22 summarizes the range of that data by comparing the average ratio for all Massachusetts municipalities, the high and low ends of the range, and the ratio for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.22

For the "average" municipality in Massachusetts, total outstanding indebtedness equaled 0.78% of total assessed property values in FY 1992. According to this measure, **Fall River's total outstanding indebtedness as a ratio of total assessed property values ranks 109th in the Commonwealth of Massachusetts.** The comparative index constructed from this data indicates that **Fall River's total outstanding indebtedness as a ratio of total assessed property values is 99% of the state average** for municipalities in Massachusetts.

Total Outstanding Indebtedness as a Ratio of Total Town/City Income: The data on total outstanding indebtedness as a ratio of total town/city income is provided for the 351 municipalities in Massachusetts in Volume II, Appendix P. Table 3.23 summarizes the range of that data by comparing the average own-source ratio for all Massachusetts municipalities, the high and low ends of the range, and the ratio for Fall River. The index factor, in which 100 equals the state average, is also included in Table 3.23.

For the "average" municipality in Massachusetts, total outstanding indebtedness equaled 2.84% of total town/city income in FY 1992. According to this measure, **Fall River's total outstanding indebtedness as a ratio of total town/city income ranks 146th in the Commonwealth of Massachu-**

setts. The comparative index constructed from this data indicates that Fall River's total outstanding indebtedness as a ratio of total town/city income is 76% of the state average for municipalities in Massachusetts.

Table 3.23. Total Outstanding Debt as a Ratio of Total Town/City Income, FY 1992.

Municipality	Ratio	Rank	Index
Whately	21.79%	1	767
State Avg.	2.84%		100
Fall River	0.77%	146	76
Acushnet	0.00%	351	0

Moody's Bond Rating: The bond ratings of the 351 municipalities in Massachusetts are included in Volume II as Appendix Q. The fact that Fall River is able to generate only half the average per capita proceeds from bonded indebtedness, despite carrying a normal debt load indicates that the low per capita proceeds are derivative of the City's weak fiscal capacity, rather than a weak fiscal effort. This conclusion is borne out by the municipal bond rating assigned to Fall River by Moody's Investors Service.

Table 3.24. Massachusetts Municipal Bond Ratings and Municipal Fiscal Capacity, FY 1992.

Bond Rating	No.	Fiscal Capacity Index Rating (Appendix B)
AAA	7	183
AA1	4	150
AA	27	135
A1	49	147
A	94	124
Baa1	26	106
Baa	12	75
Ba	5	75

Bond ratings are quite dependent on a municipality's fiscal capacity as demonstrated in Table 3.24. In FY 1992, the municipal bonds of 224 Massachusetts towns and cities were rated by Moody's Investors Service.[4] Table 3.24 summarizes the data in Appendix Q by listing the number of municipalities with different bond ratings in Massachusetts along with the average fiscal capacity index rating of the municipalities with each rating. As the data in Table 3.24 demonstrates, bond ratings are tied closely to municipal fiscal capacity. On average, the higher the fiscal capacity index rating of a municipality, the higher the bond rating.

Despite a per capita indebtedness less than half the state average, Fall River's municipal bonds carry a Moody's rating of Baa1. Municipal bonds that are rated Baa1 are considered medium grade obligations that are neither highly protected nor highly secured by the municipality's fiscal capacity. Importantly, a rating of Baa1 is assigned to municipal bonds when the security of principal and interest payments "appear adequate for the present but certain protective elements may be lacking or may be characteristically unreliable over any great length of time" (Moody's 1993, 367). Consequently, such bonds are deemed to have speculative characteristics that may come to predominate if unexpected or unpredicted fiscal circumstances substantially affect the financial operations of the municipality. Such factors could include a further deterioration of the municipality's economic and fiscal capacity or the assumption of additional fiscal burdens such as the CSO project. It should be noted that despite comparatively low per capita indebtedness, Fall

River's bond rating is in the bottom quintile of all Massachusetts municipalities (ranking 186th among the 224 towns and cities that carry a Moody's bond rating). Indeed, the fact that the average fiscal capacity index rating of other Baa1 municipalities is 106, while Fall River's fiscal capacity rating is only 49, suggests that **Fall River is able to sustain its bond rating only because of its low per capita indebtedness.**

Financing the Fall River CSO Project: Impact Scenarios

The future impact of the CSO project on Fall River's finanical operations is assessed below by designing a range of limiting cases. The impact scenarios considered below are based on the general assumption that construction of the Fall River CSO facility will begin on schedule in 1996 at a total principal cost of $130 million. The 1996 construction date is mandated by the U.S. District Court enforcement order, while the construction costs are the Maguire Group's cost estimates. The various impact scenarios discussed below are based on the further assumption that the CSO will either be financed entirely by increases in sewer fees or entirely by increases in property taxes. Finally, the analysis designates the "best case scenario" as the financing option that imposes the least total cost on the City of Fall River, while it designates the "worst case scenario" as the financing option that imposes the entire total cost on the City of Fall River.

The Best Case Scenario

Given current conditions, the best finance option that Fall River officials can reasonably hope to secure is for the Massachusetts Water Pollution Abatement Trust to provide a loan (at 25% grant equivalency) for the entire $130 million cost of the CSO project. The MWPAT's equity reserve fund provides a deep subsidy to interest rates on such loans and these interest rates are further subsidized by annual contract assistance appropriated to MWPAT by the state legislature (See Chapter 2). The net effect is that a 25% grant equivalency award appears to the municipality as if it was a twenty-year loan at approximately 6.25% simple interest. MWPAT loan agreements are structured to create level real annual payments over the course of the loan, so for purposes of the analysis, it is assumed that annual payments remain fixed over the entire course of the loan. Federal and state guidelines require the repayment of loans to begin one year after construction is completed on the project. Thus, this scenario assumes that sewer fees or property taxes will be increased beginning in Fiscal Year 2001 (i.e., the court-mandated completion date). The CSO fiscal impact based on these assumptions is designated Scenario 1. Scenario 1 requires the City to raise $7.86 million per year in additional revenue. The complete data for Scenario 1 is included in Volume II as Appendix U.

Impact on Sewer Fees: If financed entirely by sewer charges, average sewer rates would increase by 331%. The average annual bill in Fall River would increase from $96 to $317.

Impact on Property Taxes: From Fiscal Year 1989 through Fiscal Year 1992, total assessed property values in Fall River declined slightly in constant dollars (i.e., by less than two percent). This data and the City's long-term economic distress (See Chapter 4), make it reasonable to assume that there will be no real growth in the total assessed values of the Fall River property tax base for the foreseeable future. Based on this assumption, property taxes on commercial, industrial, and residential property would have to increase by 24.8% if the CSO project is financed entirely by property taxes.[5]

Impact on Fiscal Effort Indices: Using the base line data on fiscal effort, it is possible to project the impact of the best case CSO finance option on Fall River's fiscal effort. If the City opts to finance the CSO project with increased property taxes, and assuming that the City retains the current ratio between residential and business property taxation, tax rates on commercial and industrial property would rise from $19.47 per $1,000 of assessed value to $24.30 per $1,000 of assessed value. Fall River's commercial and industrial tax rates would rise from the 51st to the 17th highest in the Commonwealth of Massachusetts and would rise from a fiscal effort index rating of 140 to 175. Residential tax rates would rise from $8.13 per $1,000 assessed value to $10.15 per $1,000 assessed value. Fall River's residential tax rates would rise from the 316th lowest to the 266th lowest in the Commonwealth of Massachusetts and would rise from a fiscal effort index rating of 71 to 89.

It is irrelevant for measures of own-source revenue effort as to whether the CSO project is financed through property taxes or sewer fees, since both are components of own-source revenue. The best case scenario would raise Fall River's ratio of own-source revenues to total assessed property values from a fiscal effort index rating of 88 to a fiscal effort index rating of 101 (i.e. from below average to slightly above average). Its rank on the same scale would raise Fall River's equalized tax burden from 127th highest in the Commonwealth to 47th highest in the Commonwealth. The same scenario would raise Fall River's ratio of own-source revenues to total town/city income from a fiscal effort index rating of 69 to a fiscal effort index rating of 81 while its rank on the same scale would raise Fall River from the 300th lowest ratio in the Commonwealth to the 202nd lowest ratio in the Commonwealth. Table 3.25 provides a summary of the projected changes in tax and fee burdens and in fiscal effort indices resulting from the best case CSO finance scenario.

An Intermediate Scenario

There are several possible intermediate finance scenarios between a MWPAT 25% grant equivalency loan for the full $130 million (the best case scenario above) and full local financing through general obligation bonds (the worst case scenario below). The intermediate scenarios all involve partial funding of the CSO project by the Massachusetts Water Pollution Abatement Trust with the remainder of the required $130 million to be financed by the City through general obligation bonds. As a benchmark, an intermediate scenario has been designed based on the assumption that the MWPAT will finance 50% of the CSO with a 25% grant equivalency award. Therefore, the assumptions about construction dates, repayment schedule, and effective interest rates that were utilized in the best case scenario have been applied to $65,000,000 of the total CSO construction cost in designing the intermediate scenario.

In the intermediate scenario, it is assumed that the remaining $65,000,000 of CSO construction costs will be financed in Fiscal Year 1996 by entering the municipal bond market. During the time that this analy-

Table 3.25. Scenario 1: Projected Changes in Tax/Fee Burden and Fiscal Effort Indices.

Item	Rate		Fiscal Effort Index	
	Current	Projected	Current	Projected
Commercial Tax Rate	19.47	24.30	140	175
Industrial Tax Rate	19.47	24.30	140	175
Residential Tax Rate	8.13	10.15	71	89
Own-Source/TAPV	0.017	0.019	88	101
Own-Source/Tot Inc	0.047	0.055	69	81

sis was being completed, the interest rate on Baa-rated municipal bonds was 5.88% (Moody's 1993, 367). For two reasons, however, this analysis assumes an interest rate of 7.5% on any new municipal bond issue. First, as the nation undergoes economic recovery over the next three years, it is probable that all interest rates will increase to a certain degree. Second, as the report documents below in the debt ratio analysis, a project of this magnitude will have a severe negative impact on Fall River's municipal bond rating with the result that interest rates will further increase for the City. In defense of these assumptions, it is noted that as recently as March 1991, the interest rate on Baa municipal bonds was 7.29% (Moody's 1993, 367).

The CSO fiscal impact based on these assumptions is designated Scenario 2. Scenario 2 requires the City to raise a maximum of $10.75 million per year in additional revenue (FY 2002-2015). The complete data for Scenario 2 is included in Volume II as AppendixV.

Impact on Sewer Fees: If financed entirely by sewer charges, average sewer rates would increase by 416% during the peak rate years 2002 to 2015. The average annual bill in Fall River would increase from $96 to $399.

Impact on Property Taxes: For reasons discussed earlier, it is assumed that there will be no real growth in the total assessed values of the Fall River property tax base. Based on this assumption, property taxes on commercial, industrial, and residential property would have to increase by 33.9% if the CSO project is financed entirely by property taxes.

Impact on Fiscal Effort Indices: If the City opts to finance the CSO project with increased property taxes, and assuming that the City retains the current ratio between residential and business property taxation, tax rates on commercial and industrial property would rise from $19.47 per $1,000 of assessed value to $26.07 per $1,000 of assessed value. Fall River's commercial and industrial tax rates would rise from the 51st to the 6th highest in the Commonwealth of Massachusetts and would rise from a fiscal effort index rating of 140 to 189. Residential tax rates would rise from $8.13 per $1,000 assessed value to $10.89 per $1,000 assessed value. Fall River's residential tax rates would rise from the 316th lowest to the 225th lowest in the Commonwealth of Massachusetts and would rise from a fiscal effort index rating of 71 to 95.

The intermediate scenario would raise Fall River's ratio of own-source revenues to total assessed property values from a fiscal effort index rating of 88 to a fiscal effort index rating of 105 (i.e. from below average to above average). Its rank on the same scale would raise Fall River's equalized tax and fee burden from 127th highest in the Commonwealth to 31st highest in the Commonwealth. The same scenario would raise Fall River's ratio of own-source revenues to total town/city income

Table 3.26. Scenario 2: Projected Changes in Tax/Fee Burden and Fiscal Effort Indices.

Item	Rate		Fiscal Effort Index	
	Current	Projected	Current	Projected
Commercial Tax Rate	19.47	26.07	140	189
Industrial Tax Rate	19.47	26.07	140	189
Residential Tax Rate	8.13	10.89	71	95
Own-Source/TAPV	0.017	0.020	88	105
Own-Source/Tot Inc	0.047	0.057	69	84

from a fiscal effort index rating of 69 to a fiscal effort index rating of 84. Its rank on the same scale would raise Fall River from the 300th lowest ratio in the Commonwealth to the 193rd lowest ratio in the Commonwealth. Table 3.26 provides a summary of the projected changes in tax and fee burdens and in the fiscal effort indices resulting from the intermediate case CSO finance scenario.

The Worst Case Scenario

It is entirely possible that the Massachusetts Water Pollution Abatement Trust will not be able to finance any portion of the Fall River CSO project. This means the worst case scenario from a financial standpoint would require the City of Fall River to finance the entire cost of the CSO project through a municipal bond issue. Therefore, in the worst case scenario, it is assumed that the entire $130,000,000 of CSO construction costs will be financed in Fiscal Year 1996 by entering the municipal bond market. Once again, and for reasons discussed earlier, the analysis assumes an interest rate of 7.5% on any new municipal bond issue. The CSO fiscal impact based on these assumptions is designated Scenario 3. Scenario 3 requires the City to raise a maximum of $13.62 million per year in additional revenue (FY 1997-2017). The complete data for Scenario 3 is included in Volume II as Appendix W.

Table 3.27. Scenario 3: Projected Changes in Tax/Fee Burden and Fiscal Effort Indices.

Item	Rate		Fiscal Effort Index	
	Current	Projected	Current	Projected
Commercial Tax Rate	19.47	27.84	140	202
Industrial Tax Rate	19.47	27.84	140	202
Residential Tax Rate	8.13	11.63	71	102
Own-Source/TAPV	0.017	0.021	88	108
Own-Source/Tot Inc	0.047	0.060	69	89

Impact on Sewer Fees: If financed entirely by sewer charges, average sewer rates would increase by 501% during the peak rate years 1997 to 2017. The average annual bill in Fall River would increase from $96 to $481.

Impact on Property Taxes: For reasons discussed earlier, it is assumed that there will be no real growth in the total assessed values of the Fall River property tax base. Based on this assumption, property taxes on commercial, industrial, and residential property would have to increase by 43% if the CSO project is financed entirely by property taxes.

Impact on Fiscal Effort Indices: If the City opts to finance the CSO project with increased property taxes, and assuming that the City retains the current ratio between residential and business property taxation, tax rates on commercial and industrial property would rise from $19.47 per $1,000 of assessed value to $27.84 per $1,000 of assessed value. Fall River's commercial and industrial tax rates would rise from the 51st to the 4th highest in the Commonwealth of Massachusetts and would rise from a fiscal effort index rating of 140 to 202 (or more than double the business tax burden imposed by the average municipality in Massachusetts). Residential tax rates would rise from $8.13 per $1,000 assessed value to $11.63 per $1,000 assessed value. Fall River's residential tax rates would rise from the 316th lowest to the 174th highest in the Commonwealth of Massachusetts and would rise from a fiscal effort index rating of 71 to 102.

The worst case scenario would raise Fall River's ratio of own-source revenues to total assessed property values from a fiscal effort index rating of 88 to a fiscal effort index rating of 108. Its rank on the same scale would raise Fall River's equalized tax and fee burden from 127th highest in the Commonwealth to 21st highest in the Commonwealth. The same scenario would raise Fall River's ratio of own-source revenues to total town/city income from a fiscal effort index rating of 69 to a fiscal effort index rating of 89. Its rank on the same scale would raise Fall River from the 300th lowest ratio in the Commonwealth to 156th highest in the Commonwealth. Table 3.27 provides a summary of the projected changes in tax and fee burdens and in the fiscal effort indices resulting from the worst case CSO finance scenario.

Impact on Debt Ratios: Significantly, the three scenarios discussed above will each impact Fall River's debt ratios in exactly the same way. First, the City will be required to assume an additional $130 million in total outstanding indebtedness regardless of whether the project is financed by the MWPAT or through the issuance of general obligation municipal bonds. Second, the additional indebtedness may count toward the City's state-imposed statutory debt ceiling regardless of whether the project is financed by the MWPAT or through the issuance of general obligation municipal bonds. The normal debt ceiling for Massachusetts cities is 2.5% of equalized total assessed property values. The emergency debt ceiling for Massachusetts cities is 5.0% of equalized total assessed property values.

Table 3.28. Projected Changes Debt Ratios and Fiscal Effort Indices.

Item	Debt Ratios Current	Debt Ratios Projected	Fiscal Effort Index Current	Fiscal Effort Index Projected
Debt Per Capita	238	1,553	49	318
Debt/TAPV	0.77%	5.05%	99	647
Debt/Tot Inc	2.17%	14.17%	76	499

In Fiscal Year 1992, the City of Fall River had approximately $22,000,000 in total outstanding debt with about one-third of that debt scheduled for retirement in the next few years. Consequently, it is assumed that Fall River will still carry at least $14,000,000 in total outstanding debt by 1996. At that time, it is assumed that the City will add $130,000,000 for CSO construction, bringing its total outstanding indebtedness in 1996 to approximately $144,000,000. Once again, it is assumed that total assessed property values in Fall River will show no real growth during this time. Given these assumptions, Fall River's total outstanding debt would increase from $238 per capita to $1,553 per capita. Fall River's per capita debt load would rise from 194th lowest in the state to 25th highest in the state, while its fiscal effort index rating based on this measure would increase from 49 to 318. In other words, Fall River would move from a per capita debt load that is roughly half the state average to a per capita debt load more than triple the state average.

Given the same assumptions, the ratio of total outstanding debt to equalized total assessed property values would rise from 0.77% to 5.05%. Fall River's equalized debt load would rise from the 109th heaviest in the state to the 3rd heaviest in the state, while its fiscal effort index rating based on this measure would increase from 99 to 647. Similarly, the ratio of total outstanding debt to total town/city income would rise from 2.17% to 14.17%. Fall River's debt load as a proportion of total city income would rise from 146th highest in the state to 11th highest in the state, while its fiscal effort index rating based on this measure would increase from 76 to 499. Table 3.28 provides a summary of these projections.

There is no doubt that the projected debt load is out of all proportion to Fall River's weak fiscal capacity. Three factors are weighed heavily in drawing this conclusion. A first set of considerations stem from the fact that the debt load to be incurred as a result of the CSO project will exceed the state's normal statutory limit of 2.5% of equalized total assessed property values. Thus, any arrangements made to finance the CSO project will require the authorization of the state's Emergency Finance Board (M.G.L., section 10 and section 8, paragraph 15, of Chapter 44).[6] However, if Fall River's debt ratio actually reaches the 5.05% of equalized total assessed property values projected in this analysis, Fall River's debt ration will exceed even the emergency debt ceiling for cities in Massachusetts.

Table 3.29. Municipalities With High Debt Ratios, FY 1992.

Municipality	Ratio of Debt/TAPV	Fiscal Capacity Rating	Bond Rating
Palmer	5.90%	75	Baa1
Warren	5.09%	74	Unrated
Fall River (proj.)	**5.05%**	**49**	**Unknown**
Haverhill	4.86%	71	Baa
Whately	4.51%	132	Unrated
Barre	4.51%	65	Unrated
Conway	4.43%	94	Unrated
Monson	4.31%	77	Baa1
Southbridge	4.14%	56	A
Granville	4.10%	107	Unrated
Holyoke	3.97%	56	Baa
Westhampton	3.60%	154	Unrated
Tyngsborough	3.09%	97	A
Wendell	3.05%	74	Unrated
Avg. Fiscal Capacity Rating:		87	

The potential legal constraints imposed by the emergency debt ceiling can be circumvented in either of two ways. First the Emergency Finance Board can authorize the City to incur debt for sewer construction outside the limit of indebtedness normally allowed by state law. Second, a separate sewer authority can be created with independent power to incur indebtedness and to levy sewer fees. In the first case, the statutory debt ceiling is essentially suspended by administrative fiat. In the second case, responsibility for the debt load is shifted to a separate quasi-governmental entity for accounting purposes, even though the very same ratepayers wil be obligated for the debt incurred. Consequently neither of these legal maneuvers will resolve the more serious underlying issues concerning Fall River's municipal bond rating. Bond ratings are not assigned in a fiscal vacuum, nor are bond investors likely to be impressed with legal maneuvers designed to circumvent statutory limits created to protect municipalities from incurring debt that exceeds their fiscal capacity.

Currently, there are only thirteen municipalities in Massachusetts with total outstanding debt ratios that equal or exceed 3.0% of total assessed property values. Table 3.29 lists these municipalities, their current debt ratio, fiscal capacity rating, and present bond rating. Fall River is included for comparative purposes with its projected debt ratio.

The comparison reveals without question that the increased debt load incurred from the CSO project is excessive given the City's weak fiscal capacity and its Baa1 bond rating. Two factors warrant particular consideration: comparative fiscal ratings and bond ratings. The municipalities with debt ratios above 3.0% are a mixed assortment but all thirteen municipalities have fiscal capacity ratings higher than Fall River. Collectively, these thirteen municipalities have an average fiscal capacity rating of 87, as measured by total assessed property values per capita, compared to a rating of 49 for Fall River. Likewise, only six of the thirteen municipalities with debt ratios above 3.0% have Moody's bond ratings: two have ratings of A, two have ratings of Baa1, and two have ratings of Baa. Importantly, the Baa and Baa1 bond ratings have been assigned to municipalities after incurring abnormally high debt ratios. Fall River is able to maintain a Baa1 rating with an average debt ratio of 0.77%, but under the CSO mandate will be expected to increase its total outstanding indebtedness more than six-fold from current levels.

Table 3.30. Fall River Ready-to-Go Capital Projects, FY 1993.

Capital Expenditure Project	Construction Cost
New Schools and School Improvements	$44,000,000
City-Wide Street & Sidewalk Rehabitation	9,000,000
Replace, Clean & Cement Line of 528,000 ft. of Water main	21,120,000
Construct 1 Fire Station; Repair 3 Fire Stations	1,459,000
Construct Main Police Station; Construct Police Animal Control Headquarters	6,000,000
Window, Roof, Boiler Replacements/Schools	4,553,000
Reduction of Inflow/Infiltration in City Sewer System	10,000,000
Repairs at POTW Secondary Treatment Plant	850,000
Clean & Paint Water Tank	750,000
No. Main St.; Clean & Cement Line Water Main	1,500,000
TOTAL	$99,232,000

Thus a second consideration in concluding that the projected CSO debt load is excessive is the high probability that Fall River will be unable to sustain its current bond rating.[7] The City of Holyoke provides some guidance as to the probable impact on Fall River's bond rating. Holyke has a fiscal capacity of 56, a debt ratio of 3.97%, and a bond rating of Baa. Fall River has a fiscal capacity of 49 and would achieve a debt ratio of 5.05% under the court mandate. Given the low measures of fiscal effort, it is not likely that Fall River will default on a CSO loan or default on any other debts as a result of the CSO project. Initially, at least, it will be able to make loan or bond payments, if only with considerable difficulty. Therefore, it is improbable, though not impossible, that Fall River's bond rating would fall into any of the "C" ratings which Moody's typically reserves for bonds in default or near default.[8] Nevertheless, it is virtually certain that Fall River's outstanding bonds will fall to a Ba1 or Ba rating, effectively relegating Fall River municipal bonds to speculative or "junk" status.[9]

Finally, a third consideration in concluding the CSO debt load will be excessive is that the CSO project will effectively mortgage the future of Fall River by freezing out all other capital spending for the next ten to fifteen years. All things remaining the same, it will be approximately ten to fifteen years before the City's debt load and property values make it possible to again issue bonds within the state-imposed debt ceiling and at a better than junk bond interest rate. As an old industrial city, Fall River has numerous unmet capital needs that are vital to rebuilding its physical and human infrastructure for the next century (Cf. Commission 1990; MAPC 1990). The City's inventory of unmet capital needs already includes more than $99,000,000 in ready-to-go projects (City of Fall River 1993; Fall River Regional Task Force 1991). The list of needs is provided in Table 3.30.

Based on this report's fiscal capacity analysis, it is evident that the City of Fall River will barely be able to fund this list of unmet needs without substantial state or federal assistance. However, because the CSO project will force the City to consume its entire available credit, it is impossible to discern any scenario in which the CSO project will not freeze out all other capital spending for the foreseeable future. In effect, compliance with the federal court order will compel Fall River to sacrifice schools, fire and police protection, and drinking water improvements to combined sewer overflow abatement. Real local needs will go unmet in order to satisfy an unfunded federal mandate.

Notes

[1] The comparisons are confined to Massachusetts municipalities mainly for technical reasons. There are nearly 80,000 units of local government in the United States and the investigators are not aware of any central data base that would provide comparable data on a nationwide scale.

[2] Own-source revenues consist of revenues that can be raised directly by a municipality and that do not depend on decisions by other units or levels of government (e.g., state aid or federal grants).

[3] In general, communities on Cape Cod, Martha's Vineyard, and Nantucket have exceptionally high fiscal capacity ratings according to this measure, because the population denominator is distorted downward by the small year-round population counted as permanent residents by the U.S. Census.

[4] Fifty-four municipalities report no outstanding indebtedness. The absence of a bond rating for seventy-three other municipalities may be for reasons unrelated to the quality of the issue. The absence of a bond rating may be for any of the following reasons: (1) an application for rating was not received or accepted, (2) the issue or issuer belongs to a group of securities that are not rated by Moody's as a matter of policy, (3) there is a lack of essential data pertaining to the issue or issuer, (4) the issue was privately placed (Moody's 1993, 367).

[5] The Fall River City Council passed a resolution on April 14, 1992 requesting that the CSO project be funded by real estate taxation in order to qualify for a federal income tax deduction (City of Fall River 1992).

[6] The Emergency Finance Board includes the State Treasurer, the Director of the Bureau of Accounts, and three gubernatorial appointees.

[7] The authors of the report do not have any affiliation with Moody's Investors Service and, therefore, cannot predict what bond ratings it will assign to any municipality with absolute certainty. However, in assigning bond ratings, Moody's considers many of the same factors that have been examined in this report and, consequently, its agents will likely draw similar conclusions.

[8] It is not necessary for municipal bonds to be in default in order to receive a Moody's rating of Caa or lower. Moody's may rate a municipal bond at Caa, for instance, if it is in "poor standing" or if there are "present elements of danger with respect to principal or interest" (Moody's 1993, 367).

[9] Corporate and municipal bonds with Moody's ratings at or below Ba1 are considered junk bonds (Rutherford 1992, 310). The probability of junk bond status validates the original assumptions of this analysis that a 7.5% interest rate will be attached to any municipal bonds floated in regular investment markets as a result of the CSO mandate.

Chapter 4

The Economic Impact of the Fall River CSO Project

The CSO project will have a major impact on the economy of Fall River. If the City is forced to finance the project through sewer use fees, it is likely that some major industrial firms in the City will respond in either of two ways. Some may leave the area due to increased costs and consequently reduced profits. Others may diversify their product lines to cease production of goods that require large amounts of water and the resulting discharge into the sewer system. If either response occurs, the City of Fall River would not be able to collect the anticipated sewer use fees from these major users, and the burden of financing the CSO project would fall on the remaining firms and residential customers, possibly causing further, or second-round, migration from the City. There is at least the possibility that the response by firms may be so great that Fall River will be unable to collect adequate revenue to repay the bonds used to finance the CSO project.

This chapter analyzes the probable impact of the CSO project on the economy of the City and the region and identifies the size and nature of such an impact. Because of the difficulty of determining firms that would remain in Fall River after a significant increase in sewer use fees, this study does not attempt to identify the eventual second-round impact in the sense referred to here.

Data Sources

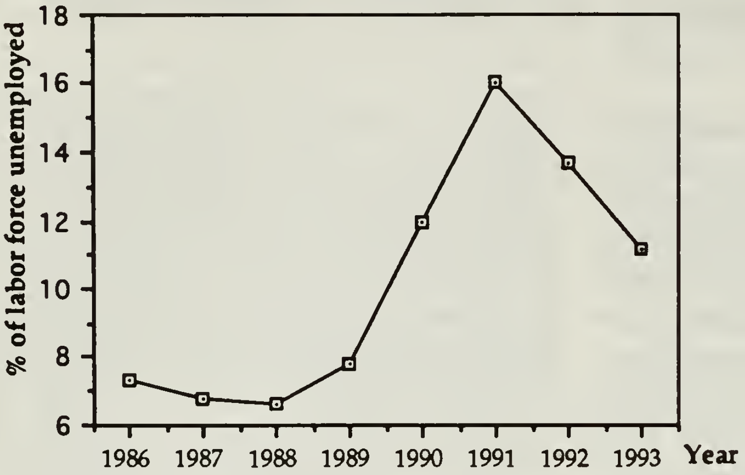
The City of Fall River is the center of the Fall River Primary Metropolitan Statistical Area (PMSA) consisting of the City of Fall River and the towns of Somerset, Swansea, and Westport, Massachusetts, and the towns of Little Compton and Tiverton, Rhode Island. The Fall River Labor Market Area (LMA) consists of the same municipalities as the PMSA. Some of the data in this chapter are reported for the City of Fall River, and some are reported for the Fall River PMSA (which is the same as the Fall River LMA). In particular, employment by industry is available for cities and towns in Massachusetts only for annual averages, while PMSA employment-by-industry data are reported quarterly. Data on unemployment are available monthly for both municipalities and Labor Market Areas. Data on employment by industry and on unemployment have been taken from unpublished public-access files maintained by the Massachusetts Department of Employment and Training (DET). Other data used in calculations are from United States government sources and publications, including the *Census of Manufacturers* of 1987 published by the Bureau of the Census.

Employment and Unemployment

The City of Fall River and the Fall River LMA have consistently had high unemployment. During the period from 1986 to 1993 the region passed from a business cycle trough through an expansion to a peak and then into a prolonged contraction to another trough from which recovery has been very slow. Figure 4.01 shows the course of the business cycle in Fall River in terms of the unemployment rate from 1986 through April of 1993[1].

Over this entire business cycle, the unemployment rate in Fall River was consistently among the highest (usually the highest) in the state and also consistently approximately double the rate for the state as a whole. Figure 4.02 shows the April 1993 unemployment rates for the City of Fall River and the state's 25 labor market areas.

Figure 4.01. Unemployment Rate, City of Fall River, 1986 - April 1993



Tables 4-1 through 4-8 on the following pages present unemployment rates over the period 1986 - April of 1993.

The data show that Fall River's unemployment rate is consistently among the highest in the state and that even in the best of times, is approximately double the rate for the state as a whole. The unemployment rate in the City has not been lower than 10% during the past four years, and has not been below 6.5% even during the era of prosperity in 1987 - 1988. These data make it very clear that the economy of Fall River is weak and vulnerable to economic shocks. The economic consequences of high unemployment are reduced tax revenues, greater dependency on transfer income, increased mortgage foreclosures and a consequent reduction in property tax revenues (due both to a direct decrease from non-payment of taxes on homes on which mortgages are in default, and indirectly from the resulting reduction in property values throughout the City). Even in the absence of further increases in unemployment, the problem must be a major concern to those who formulate policy for the City and the State.

If the City is forced to finance the CSO project from its own resources (either through sewer usage fees or property taxes), the evidence collected in this study strongly suggests that employment will decline as some firms leave the City and others choose not to expand locally. Table 4.09 shows the total number of individuals employed in the City of Fall River and the Fall River PMSA over

Figure 4.02. April 1993 Unemployment Rates Ranked

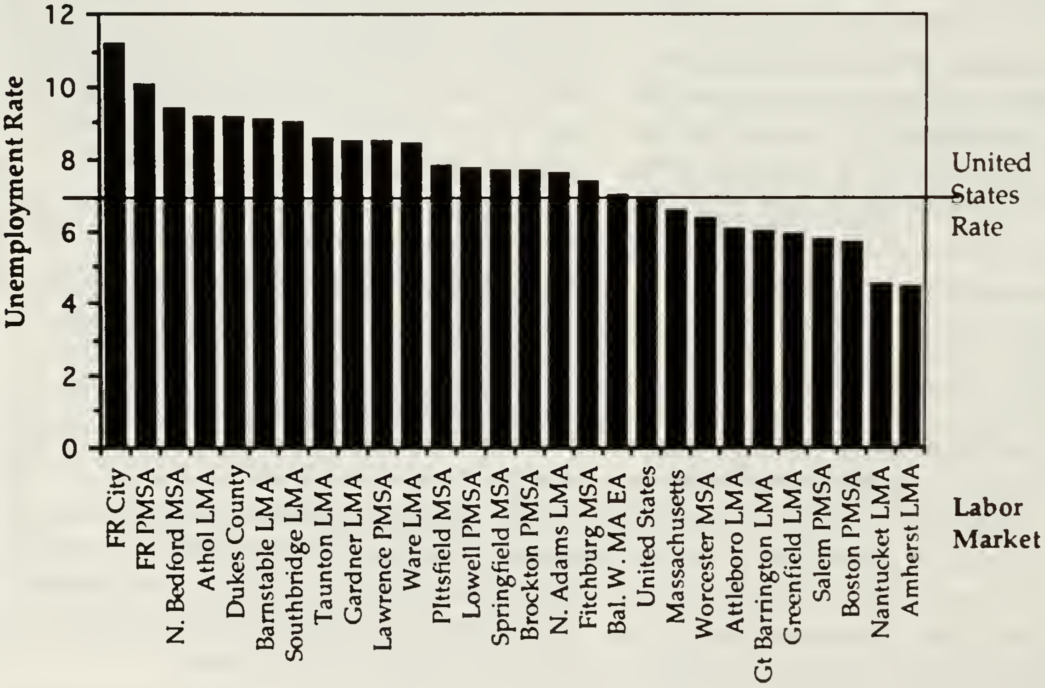


Table 4.01

April 1993 Unemployment Rates Ranked

Area	Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Fall River City	41751	37082	4669	**11.20**
Fall River PMSA	75091	67527	7564	**10.10**
New Bedford MSA	84129	76229	7900	9.40
Athol LMA	10884	9885	999	9.20
Dukes County	6092	5533	559	9.20
Barnstable LMA	99881	90748	9133	9.10
Southbridge LMA	12973	11803	1170	9.00
Taunton LMA	29613	27060	2553	8.60
Gardner LMA	14591	13343	1248	8.60
Lawrence-Haverhill PMSA	192999	176535	16464	8.50
Ware LMA	9040	8275	765	8.50
PIttsfield MSA	40667	37579	3183	7.80
Lowell PMSA	144542	133311	11231	7.80
Springfield MSA	250242	230919	19323	7.70
Brockton PMSA	94445	87160	7285	7.70
North Adams LMA	19521	18030	1491	7.60
Fitchburg-Leominster MSA	46236	42810	3426	7.40
Bal. W. MA EA	9788	9102	686	7.00
United States				**7.00**
Massachusetts	3100700	2896900	203800	**6.60**
Worcester MSA	221320	207292	14028	6.30
Attleboro LMA	54874	51545	3329	6.10
Great Barrington LMA	8996	8457	539	6.00
Greenfield LMA	26961	25355	1606	6.00
Salem-Gloucester PMSA	156510	147499	9011	5.80
Boston PMSA	1527773	1440934	86839	5.70
Nantucket LMA	4533	4329	204	4.50
Amherst LMA	32303	30872	1431	4.40

Table 4.02

1992 Unemployment Rates Ranked

	Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Fall River City	42318	36538	5781	**13.70**
Athol LMA	10902	9473	1430	13.10
Gardner LMA	14706	12902	1805	12.30
Fall River PMSA	75866	66738	9128	**12.00**
New Bedford MSA	85221	75078	10143	11.90
Southbridge LMA	13306	11760	1547	11.60
Taunton LMA	29676	26319	3356	11.30
Ware LMA	8952	7960	992	11.10
Barnstable LMA	106011	94790	11221	10.60
Brockton PMSA	95691	85805	9886	10.30
Fitchburg-Leominster MSA	46461	41850	4611	9.90
North Adams LMA	19438	17521	1917	9.90
Lawrence-Haverhill PMSA	191807	173041	18766	9.80
Lowell PMSA	148688	134095	14593	9.80
PIttsfield MSA	40250	36303	3947	9.80
Springfield MSA	252570	229826	22743	9.00
Attleboro LMA	55307	50445	4862	8.80
Bal. W. MA EA	9685	8848	838	8.70
Worcester MSA	221491	202445	19047	8.60
Dukes County	7506	6863	643	8.60
Massachusetts	3126392	2861500	264867	**8.50**
Salem-Gloucester PMSA	158024	146079	11945	7.60
Greenfield LMA	27482	25426	2056	7.50
Boston PMSA	1532370	1418160	114210	7.50
United States				**7.40**
Great Barrington LMA	9451	8880	571	6.00
Amherst LMA	31950	30049	1901	5.90
Nantucket LMA	5728	5472	256	4.50

Table 4.03

1991 Unemployment Rates Ranked

	Labor Force	Number Employed	Number Unemployed	Unemployment Rate
City of Fall River	42787	35949	6837	**16.00**
Gardner LMA	14701	12564	2138	14.50
Athol LMA	11187	9623	1564	14.00
Fall River PMSA	76027	65641	10386	**13.70**
New Bedford MSA	85595	74402	11193	13.10
Ware LMA	8773	7664	1110	12.70
Taunton LMA	28535	24963	3572	12.50
Southbridge LMA	13459	11837	1622	12.10
Fitchburg-Leominster MSA	46509	41105	5404	11.60
North Adams LMA	20309	17992	2317	11.40
Brockton PMSA	96424	85689	10735	11.10
Barnstable LMA	104615	93601	11554	11.00
PIttsfield MSA	40742	36455	4287	10.50
Lawrence-Haverhill PMSA	188471	169192	19279	10.20
Lowell PMSA	150378	135792	14585	9.70
Attleboro LMA	53808	48603	5206	9.70
Bal. W. MA EA	8854	8000	854	9.60
Worcester MSA	221413	200659	20754	9.40
Springfield MSA	253592	230048	23544	9.30
Massachusetts	3126875	2846625	280242	**9.00**
Dukes County	7971	7331	640	8.00
Greenfield LMA	27980	25745	2235	8.00
Salem-Gloucester PMSA	157254	144926	12328	7.80
Boston PMSA	1534776	1415712	119064	7.80
United States				**6.70**
Amherst LMA	31667	29739	1928	6.10
Great Barrington LMA	9554	8983	571	6.00
Nantucket LMA	5757	5443	313	5.40

Table 4.04

1990 Unemployment Rates Ranked

	Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Fall River City	43097	37943	5155	**12.00**
Gardner LMA	14641	13123	1518	10.40
Fall River PMSA	76695	69082	7613	**9.90**
Athol LMA	11151	10073	1077	9.70
New Bedford MSA	86060	78065	7995	9.30
Taunton LMA	29074	26447	2627	9.00
Ware LMA	8644	7890	753	8.70
Fitchburg-Leominster MSA	47334	43330	4004	8.50
Southbridge LMA	13332	12233	1099	8.20
Barnstable LMA	105087	96942	8145	7.80
Lawrence-Haverhill PMSA	186713	172274	14440	7.70
Brockton PMSA	99029	91670	7360	7.40
North Adams LMA	20368	18936	1432	7.00
Lowell PMSA	152199	141840	10360	6.80
PIttsfield MSA	41500	38878	2622	6.30
Attleboro LMA	54291	50911	3381	6.20
Worcester MSA	226318	212427	13890	6.10
Massachusetts	3166083	2976875	189200	**6.00**
Bal. W. MA EA	9093	8559	534	5.90
Springfield MSA	255205	240282	14923	5.80
U.S.				**5.50**
Dukes County	7754	7330	424	5.50
Greenfield LMA	27778	26343	1435	5.20
Boston PMSA	1557190	1478022	79169	5.10
Salem-Gloucester PMSA	160399	152153	8246	5.10
Amherst LMA	31729	30414	1315	4.10
Great Barrington LMA	9468	9081	386	4.10
Nantucket LMA	5769	5586	183	3.20

Table 4.05

1989 Unemployment Rates Ranked

	Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Fall River City	43365	40002	3363	**7.80**
Athol LMA	10619	9900	718	6.80
Fall River PMSA	77186	72224	4963	**6.40**
Gardner LMA	14970	14013	957	6.40
New Bedford MSA	87125	81795	5330	6.10
Taunton LMA	29442	27774	1668	5.70
Fitchburg-Leominster MSA	47635	45085	2550	5.40
U.S.				**5.30**
Lawrence-Haverhill PMSA	188126	178219	9907	5.30
Southbridge LMA	13236	12539	697	5.30
Ware LMA	8524	8074	450	5.30
Barnstable LMA	104517	99220	5297	5.10
Brockton PMSA	100275	95461	4814	4.80
PIttsfield MSA	40983	39068	1915	4.70
North Adams LMA	20209	19289	920	4.60
Lowell PMSA	154744	147765	6979	4.50
Attleboro LMA	50919	48685	2235	4.40
Massachusetts	3179750	3052942	126808	**4.00**
Springfield MSA	256153	245856	10297	4.00
Worcester MSA	221464	212773	8691	3.90
Bal. W. MA EA	9505	9138	367	3.90
Greenfield LMA	27103	26073	1030	3.80
Dukes County	7497	7231	267	3.60
Salem-Gloucester PMSA	160037	154402	5635	3.50
Boston PMSA	1568542	1515209	53334	3.40
Amherst LMA	31652	30671	981	3.10
Great Barrington LMA	9450	9193	257	2.70
Nantucket LMA	6129	6029	100	1.60

Table 4.06

1988 Unemployment Rates Ranked

	Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Fall River City	42834	40022	2812	**6.60**
U.S.				**5.50**
Athol LMA	10326	9760	566	5.50
Fall River PMSA	76531	72429	4102	**5.40**
New Bedford MSA	86025	81701	4324	5.00
PIttsfield MSA	40804	38871	1932	4.70
Gardner LMA	15111	14405	706	4.70
Southbridge LMA	12681	12105	577	4.60
North Adams LMA	19950	19073	878	4.40
Barnstable LMA	103926	99411	4515	4.30
Ware LMA	8358	7995	363	4.30
Taunton LMA	28388	27201	1187	4.20
Lawrence-Haverhill PMSA	186197	178637	7560	4.10
Fitchburg-Leominster MSA	48018	46127	1892	3.90
Brockton PMSA	98964	95207	3757	3.80
Attleboro LMA	49691	47874	1817	3.70
Lowell PMSA	153627	148394	5233	3.40
Bal. W. MA EA	9212	8899	313	3.40
Massachusetts	3154492	3051308	103167	**3.30**
Springfield MSA	254985	246656	8329	3.30
Salem-Gloucester PMSA	156327	151373	4954	3.20
Worcester MSA	220431	213789	6642	3.00
Greenfield LMA	26647	25851	797	3.00
Boston PMSA	1559747	1515711	44036	2.80
Amherst LMA	31317	30441	877	2.80
Dukes County	7622	7411	211	2.80
Great Barrington LMA	9204	8962	243	2.60
Nantucket LMA	5976	5894	83	1.40

Table 4.07

1987 Unemployment Rates Ranked

	Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Fall River City	42785	39876	2909	**6.80**
U.S.				**6.20**
Fall River PMSA	76205	71912	4293	**5.60**
New Bedford MSA	84013	79715	4298	5.10
Gardner LMA	14807	14065	742	5.00
Athol LMA	9924	9442	482	4.90
Attleboro LMA	48013	45861	2152	4.50
North Adams LMA	19267	18399	868	4.50
Lawrence-Haverhill PMSA	183579	175635	7944	4.30
Fitchburg-Leominster MSA	46331	44364	1967	4.20
Southbridge LMA	13067	12515	552	4.20
Taunton LMA	26668	25567	1101	4.10
PIttsfield MSA	39988	38436	1552	3.90
Barnstable LMA	103146	99234	3912	3.80
Ware LMA	7987	7682	305	3.80
Brockton PMSA	96582	93106	3476	3.60
Bal. W. MA EA	8538	8232	306	3.60
Lowell PMSA	149583	144482	5101	3.40
Springfield MSA	248489	240336	8153	3.30
Massachusetts	3084881	2985855	99026	**3.20**
Salem-Gloucester PMSA	150064	145377	4687	3.10
Worcester MSA	213784	207511	6273	2.90
Great Barrington LMA	9033	8775	258	2.90
Dukes County	7273	7061	212	2.90
Boston PMSA	1532116	1490310	41806	2.70
Amherst LMA	30288	29478	810	2.70
Greenfield LMA	25023	24343	680	2.70
Nantucket LMA	5812	5734	78	1.30

Table 4.08

1986 Unemployment Rates Ranked

	Labor Force	Number Employed	Number Unemployed	Unemployment Rate
Fall River City	42875	39741	3134	**7.30**
U.S.				**7.00**
Fall River PMSA	75895	70967	4928	**6.50**
New Bedford MSA	83440	78214	5226	6.30
Gardner LMA	14327	13452	875	6.10
North Adams LMA	19076	17934	1142	6.00
Attleboro LMA	47364	44701	2663	5.60
Athol LMA	10083	9519	564	5.60
Taunton LMA	26149	24701	1448	5.50
Lawrence-Haverhill PMSA	182057	173217	8840	4.90
Fitchburg-Leominster MSA	45683	43454	2229	4.90
Southbridge LMA	13588	12969	619	4.60
Brockton PMSA	94634	90544	4090	4.30
Springfield MSA	243771	233515	10256	4.20
Barnstable LMA	98694	94547	4147	4.20
PIttsfield MSA	40027	38362	1665	4.20
Lowell PMSA	147857	141818	6039	4.10
Ware LMA	8100	7777	323	4.00
Massachusetts	3058301	2940775	117526	**3.80**
Dukes County	6705	6452	253	3.80
Worcester MSA	209451	201710	7741	3.70
Salem-Gloucester PMSA	148936	143511	5425	3.60
Greenfield LMA	24510	23691	819	3.30
Bal. W. MA EA	8346	8070	276	3.30
Boston PMSA	1529262	1479574	49688	3.20
Amherst LMA	29313	28482	831	2.80
Great Barrington LMA	8971	8719	252	2.80
Nantucket LMA	5481	5346	135	2.50

the period 1986 - April 1993.

As the Table shows, Fall River and the surrounding Labor Market Area have already been hit significantly harder by a loss of jobs than the state of Massachusetts as a whole. While the state lost 5.39% of the number of jobs at the peak of prosperity in the late 1980s, the City of Fall River lost 7.93% from its peak (which came a year earlier than the peak for the state as a whole) and the LMA lost 7.26% of its jobs. Despite a modest and slow recovery from the depths of the recession in 1991 when the unemployment rate was 16%, Fall River's labor market is still significantly below where it was in 1986. The economy of Fall River was hit earlier and harder than the state as a whole. Any further declines in employment would be devastating to a regional economy already suffering the highest unemployment in the state.

Table 4.09

Employment and Loss of Jobs, 1986 - April 1993

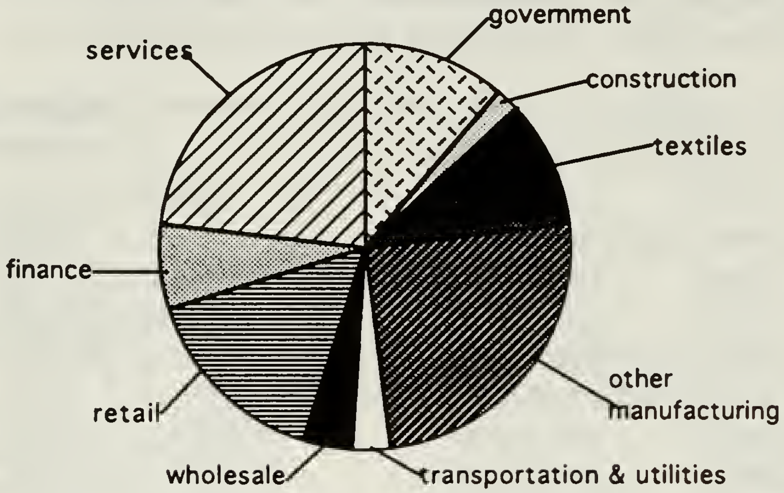
Year	Employment in City of Fall River	Employment in Fall River PMSA	Employment in Massachusetts
1986	39741	70967	2940775
1987	39876	71912	2985855
1988	40022	72429	3051308
1989	40002	72224	3052942
1990	37943	69082	2976875
1991	35949	65641	2846625
1992	36538	66738	2861500
Apr-93	37082	67527	2896900
Number of jobs lost from 1986 to April 1993	2659	3440	43875
Percent Loss	7.17%	5.09%	1.51%
Number of jobs lost from peak* to April 1993	2940	4902	156042
Percent Loss	7.93%	7.26%	5.39%

*Peak employment in the City of Fall River and the Fall River PMSA was in 1988.
Peak employment in the state of Massachusetts was in 1989.

Industrial Structure

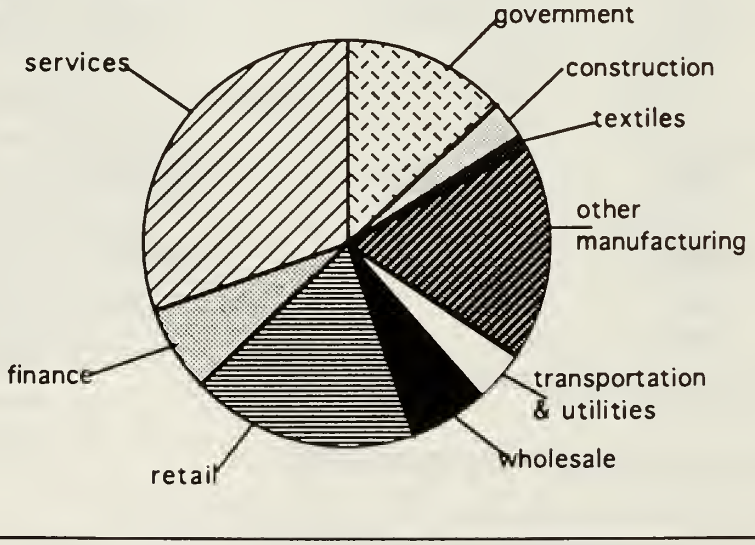
The industrial structure of the Fall River regional economy, like that of Massachusetts as a whole, is characterized by a majority of employment in service-oriented industries. In Fall River, most of the service industries sell primarily to local customers and thus depend on an export base on which the health of the entire local economy depends. In Fall River, this export base includes primarily manufacturing plants in the textile finishing and metals products industries. Fall River is 10 times more dependent on textiles (mainly textile finishing) than is the state as a whole. Figures 4.03, 4.04, 4.05, and 4.06 show the shares of employment by industry category and the shares of wages by industry category for Fall River and for Massachusetts in 1991.[2]

Figure 4.03. City of Fall River 1991 Employment by Sector



Tables 4.10 through 4.12 provide the data on which the figures are based and extend it over time. These tables show the percentage distribution of wages and employment over the period 1986 - 1991 in the City of Fall River, the Fall River PMSA, and the state of Massachusetts as a whole. The original data showing number of employees and total dollar wages is given in Appendix R in Volume II of this report. The industrial structure of Fall River, as reflected by the distribution of the labor force and wages among the various categories of industries, reflects changes over the period 1986 - 1991 similar to those for the state of Massachusetts as a whole. The most significant trend is the decrease in the share of both employment and wages generated by manufacturing industries other than textiles. The other manufacturing share of employment in Fall River declined from 30% of the workforce in 1986 to 25% in 1991. Both Services and Government increased their shares in the economy over the same period.

Figure 4.04. Massachusetts 1991 Employment by Sector



The more significant pattern for purposes of the present study is the far greater share of both employment and wages accounted for by firms that produce textile mill products (Standard Industrial Classification code 22, in the Manufacturing category, D). The share of total wages in the City accounted for by textiles was 11% in 1991; the share of employment was 10%. For the state as a

Figure 4.05. City of Fall River 1991
Wages by Sector

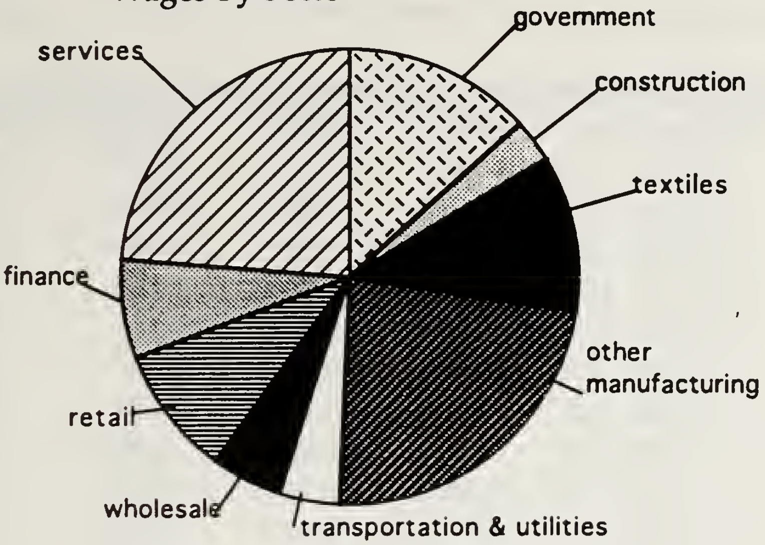


Figure 4.06. Massachusetts 1991
Wages by Sector

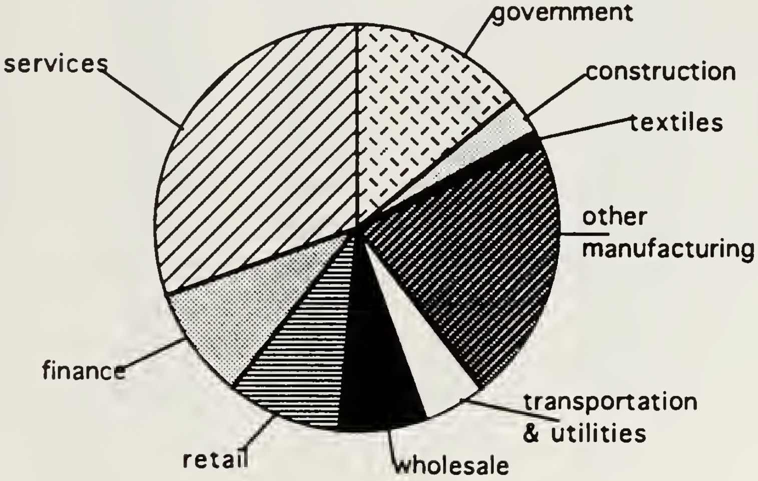


Table 4.10

City of Fall River (Annual Data for Years Shown)

Percent Distribution of Total Wages by Industry Sector, 1986 - 1991

	1991	1990	1989	1988	1987	1986
Total Govt	0.13	0.13	0.12	0.12	0.11	0.11
A-Agr.&Fores.	0.00	0.00	0.00	0.00	0.00	0.00
B-Mining	0.00	0.00	0.00	0.00	0.00	0.00
C-Construc	0.03	0.04	0.05	0.05	0.05	0.04
D-22 Textiles	0.11	0.11	0.11	0.11	0.12	0.13
D - Other Mfg	0.23	0.24	0.25	0.27	0.27	0.29
E-Trans&Util	0.04	0.04	0.03	0.04	0.04	0.04
F-Wholesale	0.05	0.05	0.05	0.04	0.04	0.04
G-Retail	0.09	0.09	0.11	0.12	0.11	0.12
H-Finance	0.07	0.07	0.07	0.07	0.06	0.06
I-Services	0.23	0.23	0.21	0.18	0.19	0.18
TOTAL	1.00	1.00	1.00	1.00	1.00	1.00

Percent Distribution of Total Employment by Industry Sector, 1986 - 1991

	1991	1990	1989	1988	1987	1986
Total Govt	0.11	0.10	0.10	0.10	0.10	0.09
A-Agr.&Fores.	0.00	0.00	0.00	0.00	0.00	0.00
B-Mining	0.00	0.00	0.00	0.00	0.00	0.00
C-Construc	0.02	0.03	0.04	0.04	0.03	0.03
D-22 Textiles	0.10	0.09	0.09	0.10	0.11	0.11
D - Other Mfg	0.25	0.26	0.27	0.28	0.29	0.30
E-Trans&Util	0.03	0.03	0.03	0.03	0.03	0.03
F-Wholesale	0.04	0.04	0.04	0.03	0.03	0.03
G-Retail	0.15	0.16	0.16	0.16	0.16	0.17
H-Finance	0.07	0.07	0.07	0.07	0.06	0.06
I-Services	0.23	0.22	0.20	0.20	0.19	0.19
TOTAL	1.00	1.00	1.00	1.00	1.00	1.00

Table 4.11

Fall River PMSA

Percent Distribution of Total Wages by Industry Sector, 1986 - 1991

	3rd QTR 92	1991	1990	1989	1988	1987	1986
Total Govt	0.11	0.14	0.14	0.13	0.13	0.13	0.13
A-Agr.&Fores.	0.01	0.00	0.00	0.00	0.01	0.00	0.00
B-Mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-Construc	0.03	0.04	0.05	0.06	0.06	0.06	0.05
D-22 Textiles	0.09	0.09	0.09	0.09	0.09	0.10	0.10
D - Other Mfg	0.22	0.20	0.20	0.21	0.23	0.24	0.25
E-Trans&Util	0.06	0.06	0.06	0.05	0.05	0.05	0.05
F-Wholesale	0.04	0.05	0.05	0.06	0.05	0.04	0.04
G-Retail	0.13	0.13	0.13	0.14	0.15	0.14	0.14
H-Finance	0.07	0.07	0.07	0.06	0.06	0.06	0.06
I-Services	0.24	0.22	0.22	0.19	0.17	0.18	0.17
TOTAL	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Percent Distribution of Total Employment by Industry Sector, 1986 - 1991

	3rd QTR 92	1991	1990	1989	1988	1987	1986
Total Govt	0.09	0.11	0.11	0.10	0.10	0.10	0.10
A-Agr.&Fores.	0.01	0.00	0.00	0.00	0.00	0.00	0.00
B-Mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-Construc	0.03	0.03	0.04	0.04	0.05	0.04	0.04
D-22 Textiles	0.08	0.08	0.07	0.07	0.08	0.08	0.08
D - Other Mfg	0.22	0.20	0.21	0.22	0.23	0.24	0.25
E-Trans&Util	0.04	0.04	0.04	0.03	0.03	0.04	0.03
F-Wholesale	0.03	0.04	0.04	0.05	0.04	0.03	0.03
G-Retail	0.22	0.22	0.22	0.22	0.22	0.22	0.22
H-Finance	0.06	0.06	0.07	0.06	0.06	0.06	0.05
I-Services	0.23	0.21	0.21	0.19	0.19	0.18	0.18
TOTAL	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Table 4.12

Massachusetts State Total

Percent Distribution of Total Wages by Industry Sector, 1986 - 1991

	3rd QTR 92	1991	1990	1989	1988	1987	1986
Total Govt	0.13	0.14	0.14	0.13	0.13	0.13	0.13
A-Agr.&Fores.	0.01	0.00	0.00	0.01	0.01	0.01	0.01
B-Mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-Construc	0.03	0.03	0.04	0.05	0.05	0.05	0.05
D-22 Textiles	0.01	0.01	0.01	0.01	0.01	0.01	0.01
D - Other Mfg	0.20	0.21	0.21	0.22	0.23	0.24	0.26
E-Trans&Util	0.05	0.05	0.05	0.05	0.05	0.05	0.05
F-Wholesale	0.07	0.07	0.08	0.08	0.08	0.07	0.07
G-Retail	0.10	0.09	0.10	0.10	0.10	0.10	0.10
H-Finance	0.09	0.09	0.09	0.09	0.09	0.09	0.08
I-Services	0.31	0.30	0.29	0.27	0.26	0.25	0.24
TOTAL	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Percent Distribution of Total Employment by Industry Sector, 1986 - 1991

	3rd QTR 92	1991	1990	1989	1988	1987	1986
Total Govt	0.12	0.13	0.13	0.13	0.13	0.13	0.13
A-Agr.&Fores.	0.01	0.01	0.01	0.01	0.01	0.01	0.01
B-Mining	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C-Construc	0.03	0.03	0.03	0.04	0.05	0.05	0.04
D-22 Textiles	0.01	0.01	0.01	0.01	0.01	0.01	0.01
D - Other Mfg	0.16	0.17	0.17	0.18	0.19	0.19	0.20
E-Trans&Util	0.04	0.04	0.04	0.04	0.04	0.04	0.04
F-Wholesale	0.06	0.06	0.06	0.06	0.06	0.06	0.05
G-Retail	0.18	0.18	0.18	0.18	0.18	0.18	0.19
H-Finance	0.07	0.07	0.07	0.07	0.07	0.07	0.07
I-Services	0.32	0.30	0.30	0.29	0.27	0.27	0.26
TOTAL	1.00	1.00	1.00	1.00	1.00	1.00	1.00

whole, only 1% of wages and employment was accounted for by textiles firms. Thus Fall River is ten times more dependent on this one industry than is the state as a whole. Clearly, firms in SIC code 22 have located in Fall River rather than elsewhere in the state (or elsewhere in the nation or world) because it was advantageous for them to do so. Interviews with executives of Fall River firms were conducted as part of the present study and are summarized in Chapter 5. Responses to questions in these interviews reveal Fall River's locational advantages.

Relative Costs, Wage Differentials, and Firm Location Decisions

The interviews indicate that for the firms surveyed, the major advantages to locating in Fall River are two: (1) a dependable, motivated labor force available at relatively low wages, and (2) relatively low cost water and sewer. Evidence of these advantages is provided in Table 4.13 which shows comparative water and sewer fees, and in Tables 4.14 and 4.15 which compare average wages by industry in Fall River to those in the state as a whole.

Table 4.13 (which also appears in Chapter 5 as Table 5.03) presents comparative data on wastewater costs in other cities in Massachusetts and in the other states most frequently referred to in the firm interviews as places textiles firms would conisder locating. The column for large industrial users (far right column) is most useful in comparing costs by location for firms that would use large quantities of water and sewer facilities for wastewater disposal. The costs are standardized at 1.5 million cubic feet. The cost in Fall River is approximately one-sixth of that in Boston, and is one-half to one-third of comparable costs in the southern states that were mentioned by firm executives as having desirable business climates. The only exceptions were Augusta, Georgia and Memphis Tennessee which had lower wastewater disposal costs than Fall River. These data suggest that Fall River does have a cost advantage in wastewater disposal costs that would be significant to firms that use large quantities of water in their production processes.

As shown in Table 4.14 wages in the textiles industry in Fall River are among the highest in both the City and the PMSA. In 1991, wages in textiles were 16% higher than the average of all industries in the City, and 21% higher than average in the PMSA. This differential is consistent over time as illustrated in the more complete tables in Appendix S. Jobs in textiles are substantially above average in Fall River, at least in terms of wages paid.

On the other hand, textile wages in Fall River are significantly lower than textile wages in the state as a whole. As Table 4.15 shows, the average textile wage in both the City and the PMSA was only 85% of the average textile wage in the state as a whole. The average wage for all industry categories was only 75% of the state average in Fall River and 72% of the state average in the PMSA. So the following two conclusions emerge from the above data: (1) Textile wages are among the highest of all industries in Fall River, and (2) textile wages are lower in Fall River than in textile firms in the state as a whole.

These observations thus provide support for the claims made in the firm interviews that textile firms have located in Fall River because of the lower costs of water and sewer, and because of the favorable labor market conditions of low wages and a dedicated, stable workforce. The same considerations apply to the other category of large employers in Fall River, metal products firms. These firms use significant amounts of water (and thus sewer facilities as well) in processing and finishing metal products, for example, in the anodyzing process. The same arguments apply to these firms. Their location decisions have been based on favorable water and sewer

Table 4.13. Wastewater Charges by state and city, 1992

STATE	CITY	RESIDENTIAL 0 CUBIC FT 0 GALS	RESIDENTIAL 500 CUBIC FT 4k GALS	RESIDENTIAL 1000 CUBIC FT 7k GALS	NON-MFG/COM 3k CUBIC FT 22k GALS	COMM'L/LT IN 50k CUBIC FT 374k GALS	INDUSTRIAL 1 MIL CUBIC FT 7,480k GALS	INDUSTRIAL 1.5 MIL CU FT 11220k GAL
MASSACHUSETTS								
	Boston	$0.00	$11.17	$22.44	$68.18	$1,187.87	$24,572.88	$36,902.88
	Fall River	$0.00	$4.80	$9.60	$13.20	$220.00	$4,400.00	$6,600.00
	Lawrence	$0.00	$7.00	$14.00	$42.00	$700.00	$14,000.00	$21,000.00
	Salem	$0.00	$6.45	$12.90	$38.70	$765.00	$18,800.00	$28,200.00
	Springfield	$0.67	$5.45	$10.90	$32.70	$599.50	$13,080.00	$19,620.00
	Worcester	$1.67	$5.28	$10.56	$31.68	$660.00	$13,200.00	$19,800.00
	AVG MO. BILL	$0.39	$6.69	$13.40	$37.74	$688.73	$14,675.48	$22,020.48
ALABAMA	Birmingham	$1.20	$3.96	$8.13	$29.16	$489.76	$9,799.76	$14,699.76
	Mobile	$6.87	$9.23	$16.31	$50.99	$836.16	$11,785.74	$16,722.54
GEORGIA	Atlanta	$0.00	$6.00	$12.00	$36.00	$600.00	$12,000.00	$18,000.00
	Augusta	$4.42	$4.85	$6.14	$12.62	$153.48	$1,939.90	$2,859.55
NORTH CAROL	Charlotte	$1.50	$7.00	$12.50	$34.50	$551.50	$11,001.50	$16,501.50
	Greensboro	$2.70	$4.50	$9.00	$27.00	$450.00	$9,000.00	$13,500.00
	Raleigh	$0.98	$5.28	$9.58	$26.78	$430.98	$8,600.98	$12,900.98
SOUTH CAROL	Charleston	$7.70	$13.77	$28.93	$91.49	$1,336.99	$26,511.99	$39,761.99
	Columbia	$2.55	$8.20	$14.15	$37.95	$597.25	$11,902.25	$17,852.25
	Greenville	$2.12	$9.33	$16.55	$43.18	$686.54	$13,693.40	$20,537.60
TENNESSEE	Chattanooga	$6.30	$12.44	$21.77	$68.42	$938.46	$11,278.30	$16,177.70
	Johnson City	$4.86	$11.22	$17.58	$46.00	$600.64	$9,861.64	$14,723.64
	Knoxville	$5.41	$13.29	$23.14	$62.54	$833.44	$12,793.44	$18,543.44
	Memphis	$1.50	$2.35	$4.11	$12.91	$219.46	$4,389.26	$6,583.90
	Nashville	$4.06	$11.65	$24.30	$70.95	$1,057.16	$16,055.05	$23,894.91
TEXAS	Corpus Christi	$7.48	$9.88	$13.48	$36.41	$472.89	$18,568.66	$27,843.06
	El Paso	$4.94	$5.25	$8.04	$19.20	$306.85	$5,680.81	$8,646.28
	San Antonio	$5.10	$8.16	$13.26	$33.61	$501.26	$9,953.76	$14,928.76
	AVG MO. BILL	$3.87	$8.13	$14.39	$41.10	$614.60	$11,378.69	$16,926.55

SOURCE: Ernst & Young 1992 National Water and Wastewater Rate Survey;
Fall River City Ordinances, Chapter 19, Article II, Division 5.

Table 4.14 Avg. Wage by Industr

Third Quarter 1992
State

Sector	Avg. Wage	%total
Total Govt	29812	1.04
A-Agr.&Fores.	21132	0.74
B-Mining	33429	1.17
C-Construc	32354	1.13
D-22 Textiles	28891	1.01
D-Other Mfg	35452	1.24
D-Total Mfg	35244	1.24
E-Trans&Util	34286	1.20
F-Wholesale	37078	1.30
G-Retail	15058	0.53
H-Finance	35818	1.26
I-Services	28003	0.98
TOTAL	28535	1.00

Third Quarter 1992
Fall River PMSA

Sector	Avg. Wage	%total
Total Govt	25623	1.25
A-Agr.&Fores.	20166	0.98
B-Mining	0	0.00
C-Construc	23637	1.15
D-22 Textiles	25404	1.24
D-Other Mfg	20233	0.99
D-Total Mfg	21558	1.05
E-Trans&Util	32490	1.58
F-Wholesale	25238	1.23
G-Retail	12076	0.59
H-Finance	23018	1.12
I-Services	21380	1.04
TOTAL	20519	1.00

1991 Annual
State Total

Sector	Avg. Wage	%total
Total Govt	29352	1.05
A-Agr.&Fores.	21139	0.75
B-Mining	33392	1.19
C-Construc	32100	1.15
D-22 Textiles	28834	1.03
D-Other Mfg	34901	1.25
D-Total Mfg	34726	1.24
E-Trans&Util	32778	1.17
F-Wholesale	36440	1.30
G-Retail	14669	0.52
H-Finance	35240	1.26
I-Services	27193	0.97
TOTAL	28030	1.00

1991 Annual
Fall River City Only

Sector	Avg. Wage	%total
Total Govt	26211	1.24
A-Agr.&Fores.	17875	0.85
B-Mining	0	0.00
C-Construc	25320	1.20
D-22 Textiles	24534	1.16
D-Other Mfg	19681	0.93
D-Total Mfg	21044	1.00
E-Trans&Util	27927	1.32
F-Wholesale	27929	1.32
G-Retail	12589	0.60
H-Finance	22086	1.05
I-Services	21629	1.03
TOTAL	21084	1.00

1991 Annual
Fall River PMSA

Sector	Avg. Wage	%total
Total Govt	26070.75	1.28
A-Agr.&Fores.	18823.00	0.93
B-Mining	0.00	0.00
C-Construc	24918.00	1.23
D-22 Textiles	24534.00	1.21
D-Other Mfg	19973.65	0.98
D-Total Mfg	21216.00	1.04
E-Trans&Util	31696.00	1.56
F-Wholesale	26489.00	1.30
G-Retail	11723.00	0.58
H-Finance	21911.00	1.08
I-Services	20813.00	1.02
TOTAL	20316.00	1.00

Table 4.14 Avg. Wage by Industr

1990 Annual
State

Sector	Avg. Wage	%total
Total Govt	28190	1.06
A-Agr.&Fores.	20189	0.76
B-Mining	32799	1.23
C-Construc	31141	1.17
D-22 Textiles	26701	1.00
D-Other Mfg	33004	1.24
D-Total Mfg	32826	1.23
E-Trans&Util	30801	1.16
F-Wholesale	34946	1.31
G-Retail	14143	0.53
H-Finance	33718	1.26
I-Services	25644	0.96
TOTAL	26667	1.00

1990 Annual
Fall River City Only

Sector	Avg. Wage	%total
Total Govt	25271	1.26
A-Agr.&Fores.	19947	1.00
B-Mining	0	0.00
C-Construc	24984	1.25
D-22 Textiles	23036	1.15
D-Other Mfg	18685	0.93
D-Total Mfg	19855	0.99
E-Trans&Util	25754	1.28
F-Wholesale	26044	1.30
G-Retail	12153	0.61
H-Finance	19220	0.96
I-Services	21227	1.06
TOTAL	20045	1.00

1990 Annual
Fall River PMSA

Sector	Avg. Wage	%total
Total Govt	25386.28	1.30
A-Agr.&Fores.	20834.00	1.07
B-Mining	0.00	0.00
C-Construc	24503.00	1.26
D-22 Textiles	23036.00	1.18
D-Other Mfg	18970.39	0.97
D-Total Mfg	20028.00	1.03
E-Trans&Util	29976.00	1.54
F-Wholesale	25320.00	1.30
G-Retail	11303.00	0.58
H-Finance	19554.00	1.00
I-Services	20452.00	1.05
TOTAL	19481.00	1.00

1989 Annual
State

Sector	Avg. Wage	%total
Total Govt	26630	1.06
A-Agr.&Fores.	19419	0.77
B-Mining	31510	1.25
C-Construc	29554	1.17
D-22 Textiles	25165	1.00
D-Other Mfg	31088	1.23
D-Total Mfg	30926	1.23
E-Trans&Util	29889	1.19
F-Wholesale	32779	1.30
G-Retail	13775	0.55
H-Finance	31525	1.25
I-Services	24010	0.95
TOTAL	25220	1.00

1989 Annual
Fall River City Only

Sector	Avg. Wage	%total
Total Govt	23726	1.25
A-Agr.&Fores.	17531	0.92
B-Mining	0	0.00
C-Construc	24157	1.27
D-22 Textiles	21900	1.15
D-Other Mfg	17872	0.94
D-Total Mfg	18915	0.99
E-Trans&Util	24948	1.31
F-Wholesale	23652	1.24
G-Retail	12751	0.67
H-Finance	17893	0.94
I-Services	19661	1.03
TOTAL	19014	1.00

1989 Annual
Fall River PMSA

Sector	Avg. Wage	%total
Total Govt	23935.86	1.29
A-Agr.&Fores.	18158.00	0.98
B-Mining	0.00	0.00
C-Construc	23519.00	1.27
D-22 Textiles	21900.00	1.18
D-Other Mfg	18099.98	0.98
D-Total Mfg	19048.00	1.03
E-Trans&Util	28476.00	1.53
F-Wholesale	23549.00	1.27
G-Retail	11569.00	0.62
H-Finance	18531.00	1.00
I-Services	18906.00	1.02
TOTAL	18557.00	1.00

Table 4.14 Avg. Wage by Industr

1988 Annual
State

Sector	Avg. Wage	%total
Total Govt	24925	1.03
A-Agr.&Fores.	19117	0.79
B-Mining	32992	1.37
C-Construc	28394	1.18
D-22 Textiles	23869	0.99
D-Other Mfg	29555	1.22
D-Total Mfg	29397	1.22
E-Trans&Util	28172	1.17
F-Wholesale	31982	1.32
G-Retail	13476	0.56
H-Finance	30744	1.27
I-Services	22633	0.94
TOTAL	24150	1.00

1988 Annual
Fall River City Only

Sector	Avg. Wage	%total
Total Govt	21241	1.21
A-Agr.&Fores.	21941	1.24
B-Mining	0	0.00
C-Construc	22910	1.30
D-22 Textiles	20137	1.14
D-Other Mfg	17132	0.97
D-Total Mfg	17906	1.02
E-Trans&Util	23135	1.31
F-Wholesale	22638	1.28
G-Retail	12663	0.72
H-Finance	17809	1.01
I-Services	16581	0.94
TOTAL	17627	1.00

1988 Annual
Fall River PMSA

Sector	Avg. Wage	%total
Total Govt	21661.31	1.25
A-Agr.&Fores.	20463.00	1.19
B-Mining	0.00	0.00
C-Construc	23321.00	1.35
D-22 Textiles	20137.00	1.17
D-Other Mfg	17244.59	1.00
D-Total Mfg	17952.00	1.04
E-Trans&Util	26141.00	1.51
F-Wholesale	22172.00	1.28
G-Retail	11337.00	0.66
H-Finance	18302.00	1.06
I-Services	16144.00	0.94
TOTAL	17263.00	1.00

1987 Annual
State

Sector	Avg. Wage	%total
Total Govt	23419	1.04
A-Agr.&Fores.	18464	0.82
B-Mining	30367	1.35
C-Construc	26611	1.18
D-22 Textiles	21696	0.97
D-Other Mfg	27502	1.22
D-Total Mfg	27337	1.22
E-Trans&Util	26968	1.20
F-Wholesale	29325	1.31
G-Retail	12630	0.56
H-Finance	27913	1.24
I-Services	20879	0.93
TOTAL	22458	1.00

1987 Annual
Fall River City Only

Sector	Avg. Wage	%total
Total Govt	19471	1.17
A-Agr.&Fores.	19966	1.20
B-Mining	0	0.00
C-Construc	22160	1.33
D-22 Textiles	19175	1.15
D-Other Mfg	15837	0.95
D-Total Mfg	16727	1.00
E-Trans&Util	23103	1.39
F-Wholesale	20666	1.24
G-Retail	11635	0.70
H-Finance	17180	1.03
I-Services	16352	0.98
TOTAL	16654	1.00

1987 Annual
Fall River PMSA

Sector	Avg. Wage	%total
Total Govt	19948.30	1.23
A-Agr.&Fores.	18318.00	1.13
B-Mining	0.00	0.00
C-Construc	21615.00	1.33
D-22 Textiles	19175.00	1.18
D-Other Mfg	15994.76	0.99
D-Total Mfg	16803.00	1.04
E-Trans&Util	25229.00	1.56
F-Wholesale	20431.00	1.26
G-Retail	10407.00	0.64
H-Finance	17244.00	1.06
I-Services	15725.00	0.97
TOTAL	16201.00	1.00

Table 4.14 Avg. Wage by Industr

1986 Annual
State

Sector	Avg. Wage	%total
Total Govt	22250	1.06
A-Agr.&Fores.	16665	0.80
B-Mining	28793	1.38
C-Construc	24519	1.17
D-22 Textiles	20464	0.98
D-Other Mfg	26047	1.25
D-Total Mfg	25887	1.24
E-Trans&Util	25507	1.22
F-Wholesale	27065	1.29
G-Retail	11567	0.55
H-Finance	25543	1.22
I-Services	19232	0.92
TOTAL	20909	1.00

1986 Annual
Fall River City Only

Sector	Avg. Wage	%total
Total Govt	19284	1.26
A-Agr.&Fores.	18824	1.23
B-Mining	0	0.00
C-Construc	20356	1.33
D-22 Textiles	18065	1.18
D-Other Mfg	14610	0.95
D-Total Mfg	15505	1.01
E-Trans&Util	22427	1.47
F-Wholesale	19398	1.27
G-Retail	10561	0.69
H-Finance	16766	1.10
I-Services	14244	0.93
TOTAL	15303	1.00

1986 Annual
Fall River PMSA

Sector	Avg. Wage	%total
Total Govt	19566.06	1.31
A-Agr.&Fores.	18079.00	1.21
B-Mining	0.00	0.00
C-Construc	20394.00	1.36
D-22 Textiles	18065.00	1.21
D-Other Mfg	14725.75	0.98
D-Total Mfg	15557.00	1.04
E-Trans&Util	24258.00	1.62
F-Wholesale	19008.00	1.27
G-Retail	9662.00	0.65
H-Finance	16794.00	1.12
I-Services	13815.00	0.92
TOTAL	14965.00	1.00

Table 4.15. Wages in Fall River and the Fall River PMSA as a Percentage of Wages in the State, by Industry 1991 and 1992

Third Quarter 1992
FR PMSA as % of State

Sector	
Total Govt	0.86
A-Agr.&Fores.	0.95
B-Mining	0.00
C-Construc	0.73
D-22 Textiles	0.88
D-Other Mfg	0.57
D-Total Mfg	0.61
E-Trans&Util	0.95
F-Wholesale	0.68
G-Retail	0.80
H-Finance	0.64
I-Services	0.76
TOTAL	0.72

1991 Annual
City of Fall River as % of State

Sector	FR/State
Total Govt	0.89
A-Agr.&Fores.	0.85
B-Mining	0.00
C-Construc	0.79
D-22 Textiles	0.85
D-Other Mfg	0.56
D-Total Mfg	0.61
E-Trans&Util	0.85
F-Wholesale	0.77
G-Retail	0.86
H-Finance	0.63
I-Services	0.80
TOTAL	0.75

1991 Annual
FR PMSA as % of State

Sector	FRPMSA/State
Total Govt	0.89
A-Agr.&Fores.	0.89
B-Mining	0.00
C-Construc	0.78
D-22 Textiles	0.85
D-Other Mfg	0.57
D-Total Mfg	0.61
E-Trans&Util	0.97
F-Wholesale	0.73
G-Retail	0.80
H-Finance	0.62
I-Services	0.77
TOTAL	0.72

costs and favorable labor force conditions.

Against these advantages, every executive interviewed stated that there were nearly overwhelming disadvantages of a Massachusetts location. These disadvantages have to do with the high costs of Workers' Compensation, health insurance, and the difficulty of complying with environmental regulations as administered by the state government. These disadvantages were so strong that every executive interviewed stated that if the firm had it to do over again, they would not have located in Massachusetts. Few of them would consider expanding from their present Fall River locations and none would consider locating elsewhere in Massachusetts.

The business climate in Massachusetts generally is not favorable compared to that available elsewhere, particularly in the southern states of North and South Carolina, Georgia, Tennessee, and Alabama. The principal factors keeping business firms in Fall River are the favorable labor force characteristics of the committed workforce and relatively low wages, and the low costs for water and sewer services. If there are significant increases in any of these costs, Fall River's locational advantages will be eroded, perhaps to the point of causing firms to migrate to other, lower-cost locations. The results of the interviews indicate that outmigration is a strong possibility for several of the major employers in Fall River.

Several of the executives interviewed stated that they were actively considering relocation to other states. One firm's executives stated that the firm is presently constructing a plant in Alabama that would have been constructed in Fall River if the economic climate had been more favorable. The assessment of the present study is that statements by industrialists that they are considering relocation are not empty threats or self-serving gestures. The textile industry, in particular, is a fiercely competitive one involving worldwide competition by firms in Mexico, Korea, and other low-cost nations. Only by securing locations and technologies that permit lowest-cost production do such firms survive. There are strong economic pressures from world markets constraining firms located in Fall River. If the City loses its locational cost advantages, it will also loose some of these firms and the jobs and income they provide.

Regional Economic Impact Multipliers

One of the fundamental principles of economics is that industries are interconnected to form what is sometimes referred to as an economic system. As products pass through the process of production, they are sold by one firm to another. Finally, finished products are delivered to consumers. In order to produce finished textile products, for example, a textile finisher must obtain cloth, sizing, dyes, and other necessary ingredients. The firm must also buy office supplies, electricity, water, wasterwater disposal services and facilities, cleaning supplies, equipment, hand tools, automobiles, trucks, ladders, paper, and a myriad of other products in order to produce finished textiles. One of the most important inputs that firms buy is labor services. Wages paid to workers provide household income from which workers, as consumers, purchase groceries, housing, medical services, furniture, appliances, clothing, entertainment, and other products. In the absence of the sale of the finished textiles, these purchases by the firm and by the households of workers would not have been possible, or at least would have been reduced.

It is possible, therefore, to distinguish two types of expenditures that result from the productive activities of firms, whether in textiles or any other industry. Direct effect expenditures are those made by the firm itself in purchasing products (supplies or services, for example) from other firms or in purchasing labor services from workers. Indirect effect expenditures result when these other firms and households spend the money received from the textile firm in purchasing their required inputs or consumer items. The combined expenditures of direct and indirect effects are the total effect expenditures.

Local economic activities that create jobs and generate income for those who work an dlive in a community depend ultimately on sales of products to other communities, whether in the United States or worldwide. The total effect expenditures made by textile firms involve not only dollar flows for transactions, but create jobs in other industries as well. The direct employment effect involves workers employed by textile firms; the indirect employment effect involves workers employed by firms that supply textile firms or sell products to households whose income comes from employment in textiles firms. The total employment effect is the combined total number of jobs involved in both textiles and supplying industries. The patterns of interindustry dependencies and employment are summarized in an input-output table. Such tables may be used to identify the impact on the economy as a whole resulting from a change in one industry.

The United States Department of Commerce has developed a system to estimate these expenditure and employment effects on a regional basis. Based on information from the Censuses of Manufacturers and the Input/Output Table for United States industries, the Regional Input-Output Modeling System (RIMS II)[3] permits state- and industry-specific estimates of expenditure and employment effects within the *immediately surrounding* economic region (as opposed to the economic system as a whole, regardless of proximity to the firm or industry to which a change might occur).

Use of the Commerce Department system requires that the value of sales by an industry be known. Because most of the firms interviewed were reluctant to release proprietary information about operations and profitability, it was necessary to estimate the sales (or value of shipments) for Fall River firms. Data on payroll by industry are available from the Massachusetts Department of Employment and Training (DET).[4] Data on both payroll and the value of shipments are available from the Census of Manufacturers[5] specific to individual states and industries within the states. To estimate the value of shipments of the Fall River firms, the ratio of value of shipments to total payroll was taken from the Census of Manufacturers for textile firms (SIC code 22) in Massachusetts. This ratio was then multiplied by the total payroll of Fall River textiles firms (SIC code 22) as identified in the DET database. This procedure yielded an estimate of the value of shipments from Fall River Textiles firms. The dollar value of output was then multiplied by the regional impact multipliers to identify total expenditures multiplier effects, earnings multiplier effects, and employment multiplier effects. Because the RIMS II multipliers are based on 1989 dollars, values were first converted to 1989 equivalents and then converted back to current dollars. The details of these calculations are given in Appendix T.

Table 4.16 summarizes the impact on the economy of the Fall River region of the migration or closure of the textile firms now operating in the City.

These estimates are predicated on the assumption of an increase in sewer fees large enough to cause all of the textile firms to leave or to close. In other words, it assumes that the textile industry, a heavy water and sewer user, would lose its locational advantages and would either move to areas outside Massachusetts where costs of operating are more favorable, or would attempt to remain in Fall River but would fall victim to the competitive world market for textile products and would eventually go out of business.

The results of such a collapse of the Fall River textile industry would be the loss of

Table 4.16. Impact of a collapse of the Textiles Industry (SIC code 22) on Fall River

employment units:	35
1991 total payroll:	$85,208,182
1991 employees:	3,473

(Source: Massachusetts DET, ES202 File)

Loss of all 35 units would result in the following estimated losses (annual rate for sales and earnings):

	(Textiles) Direct Impact	(Other Industries) Indirect Impact	Total Impact
Sales	$349,353,546	$453,323,372	$802,676,918
Earnings	$85,208,182	$110,351,790	$195,559,972
Employment	3,473	3,521	6,994

Reference: Total Employment (1991):

City of Fall River	Fall River PMSA
35,949	65,641

(6,994 jobs is 10.7% of the total number of jobs in the FR PMSA; the unemployment rate for 1991 would have increased from 13.7% to 22.9% in the Fall River PMSA during 1991)

3,473 jobs in textiles, 3,521 jobs in local industries that supply textile firms, for a total loss of 6994 jobs in the Fall River labor market. This is 10.7% of the total number of jobs in the Fall River Labor Market Area and includes textiles jobs which, as previously shown, provide above-average wages in Fall River. If the 6994 employees became unemployed and no other changes occurred in the labor force, the unemployment rate in the Fall River PMSA would increase from the actual rate of 13.7% (1991) to 22.9%. If the same impact were applied to the April 1993 data, the unemployment rate for the Fall River PMSA would increase from the actual rate of 10.1% (April 1993) to 19.4%. These impacts imply an economic collapse for the Fall River labor market and the City.

The estimated earnings impact involves a loss of over $195 million of income in the Fall River PMSA *per year*. This exceeds the projected one-time cost of the proposed CSO tunnel of $130 million.

Funding and Capacity to Repay Bond Issues

Textile finishing firms and other water-using firms in Fall River are major employers. They are also major payers of sewer and water fees and property taxes. During 1992, firms interviewed as part of this study paid $629,940 of the total sewer fees collected of $3,644,652.[6] This is 17.3% of the total. If any of these major accounts were lost to the City, the operating and repayment funding costs would have to be picked up by the remaining industrial, commercial, and residential customers. In the case of sewer fees, even if firms did not leave the City or close, they are likely to react to a significant increase in sewer fees by adopting technologies that would reduce water and sewer usage, if possible, or by dropping the production of products that require substantial amounts of water and sewer.[7] In either case, the sewer revenues on which the City relies to repay bonds used to finance the CSO project would be substantially reduced.

The same argument applies to property tax revenues. Of the 13 firms interviewed, property tax payments to the City of Fall River for fiscal year 1992 were obtained from six (6) of the firms. These six firms paid a total of approximately $801,550 in property taxes in fiscal year 1992. This represents 18.3% of the total industrial class tax levy for 1992 and 2.5% of the total tax levy for the City for fiscal 1992. If property taxes increase to finance the CSO project, firms may either close or restrict production activity. Either response would lead to a reduction of property tax revenues collectible by the City and the possibility that the City would not be able to raise adequate revenue to repay interest and principal of the bonds. As the fiscal analysis of Chapter 3 suggests, even under the assumption of no response by industrial firms to increased property taxes (that is, even if the firms are assumed to continue producing at the going rate at their Fall River locations), the City would be unable to issue bonds for any other purpose during the 20-year period of repayment.

There are also questions about the City's ability to successfully float the bonds at all. Fall River's present bond rating of Baa1 puts the City just on the edge of "junk bond" status. Financial markets are likely to react unfavorably to an attempt by Fall River to issue new bonds. At a minimum, the City's bond rating will deteriorate. Prospective buyers will have to be convinced that the City will have the fiscal capacity to repay interest and principal or it may not be possible to obtain funding for the CSO project at all.

Conclusion

The economy of the Fall River region is one of the most vulnerable in Massachusetts. Unemployment rates in excess of 10% have prevailed for the past several years and have been as high as 16%. Unemployment in the City of Fall River is typically double the unemployment rate for the state as a whole. The regional economy is highly dependent on firms that produce textile mill products and other products that require plentify supplies of water and low-cost wastewater/sewer facilities. If the funding of the proposed CSO project raises sewer fees, as it will if the City of Fall River is forced to finance the project without outside financial assistance, it is likely that some major employers will either leave the City or close. Other firms may continue to operate but change their product mix to cease or reduce production of products that require large amounts of water and sewer. The loss of firms would reduce earned income in the labor market area; it would also reduce the property taxes collected by the City and will reduce the amount of sewer fee revenue. The losses of earned income alone are likely to exceed the cost of the CSO project.

The losses of property tax revenue and sewer fee revenue may make it difficult or impossible for the City to repay the principal and interest on bonds issued to finance the CSO project. Financial markets will have to be convinced that the City has the capacity to repay principal and interest or it will not be possible to float the bonds for the CSO. Even if repayment is possible, the contractionary impact of funding the CSO project is likely to cause an economic collapse of the region.

The goal of the Federal court order, of course, is to eliminate the CSO overflows into the Taunton River during heavy rainstorms, and any reduction in the volume of wastewater flows would contribute to this goal. Though thee wastewater flows from the textile firms and other industrial users are a substantial share of the normal wastewater flows, it is not clear that their complete elimination would solve the overflow problem. The problem has to do with volume, not the toxicity of the wastewater flows coming from the industrial firms. The firms have all or nearly all installed some form of pretreatment facilities to ensure that wastewater discharged into the Fall River sewer system is free of toxic chemicals and solids. The volume of the discharges are the primary concern with respect to the goals of the suit against the City by the Conservation Law Foundation. The fact remains, however, that the source of the excess volume problem and consequent CSO overflow is heavy rainfall. Closing industrial firms or causing them to reduce their discharges will not eliminate the overflow problem. If the firms are adversely affected and forced to leave the City or restrict operations, only the financing of the CSO project will be affected, not the problem of excess volume.

Notes

[1] April of 1993 was the most recent month for which unemployment data are available for cities and towns in Massachusetts at the time the research on which this report is based was completed.

Figure 4.01 shows the unemployment rate; the peak of unemployment coincides with the lowest point of the business cycle trough. Business cycle expansions will show up as decreases in the unemployment rate, while business cycle contractions will show up as increases in unemployment.

[2] 1991 is used because this is the most recent year for which the detailed industrial-breakdown data are available for cities and towns.

[3] United States Department of Commerce, Bureau of Economic Analysis, *Regional Multipliers: A User Handbook for the Regional Input-Output Modeling System (RIMSII).* Second edition. Washington DC: U.S. Government Printing Office, May 1992.

[4] Massachusetts Department of Employment and Training, unpublished public-access ES202 databank available on-site only in the Research Library of the DET in the Hurley Building, Boston. At the time of the present study, the most recent year for which city and town data were available was 1991.

[5] United States Department of Commerce, Bureau of the Census, *1987 Census of Manufactures, General Summary*, Washington DC: March 1991 and *Geographic Area Series, Massachusetts*, November 1990.

[6] Information provided by Terrance J. Sullivan, Assistant Supervising Engineer, Fall River Sewer Commission.

[7] One of the larger firms interviewed indicated that while they would be unlikely to move or close in response to a 6-fold increase in sewer fees, they would cease production of a particular line of products that involve heavy water use. The production would either be shifted to a site elsewhere or terminated.

Chapter 5

Interviews With Executives of Major Employers in Fall River

To gain a sense of how various CSO finance scenarios might impact the City's business climate, sixteen local executives were interviewed *in situ* over a five day period using a common questionnaire form. The interviewees were company owners, chief executive officers, senior vice-presidents, treasurers, and operations managers,primarily of textile firms and other major manufacturing companies in the City. In all, the executives represented thirteen companies with manufacturing operations in Fall River that collectively employ more than 4,600 people (or about 10% of the City's total workforce).

The executives who were interviewed do not constitute a scientific random sample of Fall River business executives. Instead, the interviews focused on textile dyers and finishers as well as other manufacturing firms with "water-intensive" industrial processes. Thus, for the most part, firms were selected from among the thirty-five largest water users in Fall River, although some non-water-intensive firms were included if they constituted a major employer in the City. There are two reasons why the interviews focused on these particular companies, rather than on a sceintific cross-section of the entire business community. First, the operations of water-intensive industries, especially textile firms, will be affected most by the proposed CSO project if it is financed through dedicated increases in sewer fees as currently planned by the City Administration. Second, as our economic base study demonstrates, Fall River is exceptionally dependent on the textile industry for employment and wages. Not only does the textile industry account for an unusually large proportion of the City's employment base, textiles generally provide the City's highest paying jobs for blue-collar operatives. Thus, even a moderate amount of business flight in the textile industry will have serious repercussions throughout the entire Fall River economy.

The interviews with local executives can be divided into three parts: (1) factors affecting business location and expansion decisions, (2) expectations for workforce expansion or reduction and (3) a series of questions designed to measure how various CSO finance scenarios might impact decisions concerning relocation and local expansion.

Business Location Factors

There are many factors that influence business location decisions, including the wages and skills of a local workforce, utility costs, taxes, regulatory environments, infrastructure, and the availablity of local services. It is rarely the case that any single factor is the sole determinant of a business location decision. However, some factors are inherently more important than others in particular industries, while otherwise negligible factors may become "the last straw" in a location decision when judged against the cumulative impact of the many factors affecting a company's cost structure.

To establish such a context, interviewees were asked to rate the importance of several factors that might affect their decisions when considering proposals to relocate or expand their Fall River manufacturing operations. Executives were asked to rate a list of nineteen business location factors on a scale of one to ten. The factors include locational

Table 5.01. Factors Affecting Business Location Decisions: Composite Rating of Fall River Executives.

BUSINESS LOCATION FACTOR	AVERAGE RATING
1. Electrical utility costs	9.4
2. The absence of unions	9.3
3. Gas utility costs	8.8
4. Strictness of state environmental regulations	8.8
5. Local solid waste disposal fees	8.7
6. Local water fees	8.5
7. Wage levels of mfg. operatives	8.4
8. Quality of local services (e.g., fire/police)	8.1
9. State corporate income taxes	7.8
10. Local sewer fees	7.6
11. Strictness of state health and safety regulations	6.9
12. Overall local quality of life	6.8
13. Quality of local infrastructure (e.g., roads, airports, seaport)	6.6
14. Quality of local schools	6.6
15. Skills of the local workforce	6.3
16. Local property taxes	5.4
17. Federal corporate income taxes	4.6
18. Nearness to markets	4.4
19. Nearness to suppliers	4.0

advantages, utility costs, workforce characteristics, and various costs controlled by federal, state, and local governments. A rating of ten means that a factor is considered "Very Important," while a rating of one means that a factor is "Not Important." Table 5.01 shows the average composite rating given to the several factors and lists them in their order of overall importance. Table 5.02 shows the number of executives who rated a particular factor as Very Important (i.e. 9 or 10) and, similarly, lists them in rank order.

Among the ten highest rated factors, five constitute distinct competitive disadvantages for the City of Fall River. Most of the executives interviewed noted that electrical and gas utility costs, wage levels, state environmental regulations, and local union strength were negative factors in their locational assessments about Fall River. Indeed, nearly all of the executives interviewed expressed a visceral disaffection with Massachusetts as an "anti-business" state. It is regarded, quite accurately, as a high-cost state for doing business, especially because of its high utility costs, high wages, high fringe benefits costs, and non-competitive state mandates such as workmens' compensation[1] and unemployment insurance (Schattle 1993). In addition, some executives complained about inflexible union work rules in their companies and excessive delays in environmental permitting processes controlled by the Massachusetts Department of Environmental Protection. Executives considered any one, or even some combination of these factors, a tolerable cost of doing business in Massachusetts. However, the cumulative impact of all of these factors creates such an abnormally high cost structure in Massachusetts that local executives report a persistent tendency to look for alternative locations. Executives from one-third of the companies interviewed volunteered spontaneously that: "We are always looking [for an alternative location]."

The state's corporate income tax was rated 9th among the ten highest-rated locational factors and, on the modal scale, the local property tax was 10th among factors considered very important to local executives. These intermediate ratings are consistent with recent findings by the state's Special Commission on Business Tax Policy which concluded that "in general, Massachusetts' overall tax structure is neither a liability nor an asset in interstate economic competition" (Tannenwald 1993). It would appear that state and local taxes are a "neutral" factor in business location decisions. State and local taxes do not provide a strong incentive to remain or expand in Fall River, nor do they create a strong disincentive to remain or expand in Fall River.

Table 5.02. Factors Affecting Business Location Decisions: Modal Ratings by Fall River Executives.

BUSINESS LOCATION FACTOR	No. Rating 9 or 10
1. The absence of unions	15
2. Electrical utility costs	12
3. Gas utility costs	12
4. Wage levels of mfg. operatives	11
5. Strictness of state environmental regulations	11
6. Local solid waste disposal fees	10
7. Local water fees	10
8. Local sewer fees	8
9. State corporate income taxes	7
10. Local property taxes	6
11. Strictness of state health and safety regulations	6
12. Federal corporate income taxes	5
13. Quality of local services (e.g., fire/police)	4
14. Overall local quality of life	2
15. Skills of the local workforce	2
16. Nearness to markets	1
17. Quality of local schools	1
18. Quality of local infrastructure (e.g., roads, airports, seaport	1
19. Nearness to suppliers	0

Consequently, we conclude that Fall River's chief competitive disadvantage with respect to its core industries is the fact that firms are burdened by a number of high-cost factors and operational inflexibilities that the City cannot decisively influence or control. In other words, because of the high cost structure in Massachusetts, the City is always fighting an uphill battle to retain its current economic base. On the other hand, four of the ten highest rated locational factors cited by local executives can, in principle, be controlled by local government: solid waste disposal fees, water fees, local services, and sewer fees. Empirically, it can be established that Fall River has a distinct competitive *advantage* with respect to at least two of these factors: water fees and sewer fees.

In order to establish the degree to which these two factors might constitute a competitive advantage for the City of Fall River, it was first necessary to determine what, if any, alternative locations were being considered by local executives. A series of questions was asked to make this determination. The answers indicated that owners or boards of directors from eight (62%) of the thirteen firms represented had recently considered actual proposals to relocate their

Fall River manufacturing operations to a location other than Fall River. The answers also indicated that owners or boards of directors from seven (54%) of the thirteen firms represented had considered actual proposals to expand their manufacturing operations in a location other than Fall River. Most of these proposals involved active solicitations by state or local economic development agencies that offered tax abatements, "one-stop" permitting and licensing procedures, relocation assistance, job training assistance, and lower mandated costs (e.g., workers' compensation, unemployment insurance, environmental regulation). In a few cases, the potential overall reduction in a firm's cost structure amounted to several million dollars per year.

Executives were asked to name the sites that had been actively considered or that might be considered for relocation or expansion. Executives from twelve (92%) of the thirteen firms represented indicate that they would never consider any site in Massachusetts as an alternative business location. Six (46%) of the thirteen firms represented indicate that they *might* consider Mexico as a foreign location, but in fact only one such proposal had been actually considered and it was ultimately rejected. One firm had actually expanded operations in the Far East (Indonesia) for quite exceptional reasons and one firm was seriously considering a proposal to expand in China. However, with respect to the textiles industry and non-apparel manufacturing operations, it is very clear that neither Massachusetts, nor foreign locations, are serious competitors for Fall River's core industries.

Among the firms that had actively considered proposals to relocate or expand their manufacturing operations, the southeastern United States consistently emerged as an alluring alternative. The states that were mentioned as possible sites for relocation are North Carolina (6), Tennessee (5), Georgia (5), South Carolina (4), Alabama (3), and Texas (1). The states that were mentioned as possible sites for expanding manufacturing operations are Alabama (5), North Carolina (4), Tennessee (4), Georgia (4), and South Carolina (4). Based on the frequency of mention, the enthusiasm of the executive responses, and the aggressiveness of the incentive packages offered for relocation, it is evident that development agencies in North Carolina, Tennessee, and Georgia are making a concerted effort to lure Fall River's textile industry, as well as other manufacturing firms, to the southeastern United States.

In addition to the direct subsidies offered by state development agencies, local executives cited lower overall cost structures, streamlined licensing and permitting processes, and strong post-secondary technology programs as the main incentives for relocating or expanding to the southeast. On the other hand, local executives frequently cited two factors as positive reasons for remaining in the City of Fall River. First, many executives considered the high availability of an unskilled, but motivated, loyal, and stable workforce as a "positive" inducement for remaining in Fall River. However, this factor was cited mainly by executives with firms that were determined to be fairly immobile anyway. Moreover, it must be noted, that such a factor depends on the continuation of the City's long history of relatively high unemployment even during periods of national economic growth.

Thus, with respect to the Fall River firms that seem most capable of relocating or expanding elsewhere, the one truly positive locational advantage is low water and sewer fees. Table 5.03 illustrates this locational advantage. Table 5.03 compares the monthly wastewater charges in Fall River with communities located in the states identified as competitors during the interview process. For light industrial and industrial users, wastewater charges in Fall River are only 36% and 39%, respectively, of the average for the communities surveyed in competitor states. The

Table 5.03. Wastewater Charges by state and city, 1992

		RESIDENTIAL	RESIDENTIAL	RESIDENTIAL	NON-MFG/COM	COMM'L/LT IN	INDUSTRIAL	INDUSTRIAL
		0 CUBIC FT	500 CUBIC FT	1000 CUBIC FT	3k CUBIC FT	50k CUBIC FT	1 MIL CUBIC FT	1.5 MIL CU FT
STATE	CITY	0 GALS	4k GALS	7k GALS	22k GALS	374k GALS	7,480k GALS	11220k GAL
MASSACHUSETTS								
	Boston	$0.00	$11.17	$22.44	$68.18	$1,187.87	$24,572.88	$36,902.88
	Fall River	$0.00	$4.80	$9.60	$13.20	$220.00	$4,400.00	$6,600.00
	Lawrence	$0.00	$7.00	$14.00	$42.00	$700.00	$14,000.00	$21,000.00
	Salem	$0.00	$6.45	$12.90	$38.70	$765.00	$18,800.00	$28,200.00
	Springfield	$0.67	$5.45	$10.90	$32.70	$599.50	$13,080.00	$19,620.00
	Worcester	$1.67	$5.28	$10.56	$31.68	$660.00	$13,200.00	$19,800.00
	AVG MO. BILL	$0.39	$6.69	$13.40	$37.74	$688.73	$14,675.48	$22,020.48
ALABAMA	Birmingham	$1.20	$3.96	$8.13	$29.16	$489.76	$9,799.76	$14,699.76
	Mobile	$6.87	$9.23	$16.31	$50.99	$836.16	$11,785.74	$16,722.54
GEORGIA	Atlanta	$0.00	$6.00	$12.00	$36.00	$600.00	$12,000.00	$18,000.00
	Augusta	$4.42	$4.85	$6.14	$12.62	$153.48	$1,939.90	$2,859.55
NORTH CAROL	Charlotte	$1.50	$7.00	$12.50	$34.50	$551.50	$11,001.50	$16,501.50
	Greensboro	$2.70	$4.50	$9.00	$27.00	$450.00	$9,000.00	$13,500.00
	Raleigh	$0.98	$5.28	$9.58	$26.78	$430.98	$8,600.98	$12,900.98
SOUTH CAROL	Charleston	$7.70	$13.77	$28.93	$91.49	$1,336.99	$26,511.99	$39,761.99
	Columbia	$2.55	$8.20	$14.15	$37.95	$597.25	$11,902.25	$17,852.25
	Greenville	$2.12	$9.33	$16.55	$43.18	$686.54	$13,693.40	$20,537.60
TENNESSEE	Chattanooga	$6.30	$12.44	$21.77	$68.42	$938.46	$11,278.30	$16,177.70
	Johnson City	$4.86	$11.22	$17.58	$46.00	$600.64	$9,861.64	$14,723.64
	Knoxville	$5.41	$13.29	$23.14	$62.54	$833.44	$12,793.44	$18,543.44
	Memphis	$1.50	$2.35	$4.11	$12.91	$219.46	$4,389.26	$6,583.90
	Nashville	$4.06	$11.65	$24.30	$70.95	$1,057.16	$16,055.05	$23,894.91
TEXAS	Corpus Christi	$7.48	$9.88	$13.48	$36.41	$472.89	$18,568.66	$27,843.06
	El Paso	$4.94	$5.25	$8.04	$19.20	$306.85	$5,680.81	$8,646.28
	San Antonio	$5.10	$8.16	$13.26	$33.61	$501.26	$9,953.76	$14,928.76
	AVG MO. BILL	$3.87	$8.13	$14.39	$41.10	$614.60	$11,378.69	$16,926.55

SOURCE: Ernst & Young 1992 National Water and Wastewater Rate Survey; Fall River City Ordinances, Chapter 19, Article II, Division 5.

same is true of monthly water charges.

For water-intensive industries, especially, such a difference in costs can be considerable. For example, among the most water-intensive firms in Fall River annual wastewater bills range from $276,000 per year to $1.5 million per year. Thus, depending upon the firm, Fall River's wastewater charges offer an offsetting advantage of anywhere from $0.5 million to $3.0 million per year over most communities in the southeastern United States. Fall River's low water rates effectively double this cost advantage for the affected firms. However, as was demonstrated in considering the various CSO finance options, the best case scenario (i.e., full MWPAT financing at 25% grant equivalency) will require a tripling of wastewater charges. This will effectively eliminate Fall River's last competitive advantage with respect to its core industries. Anything beyond the best case scenario will turn what is currently a competitive advantage into a very serious competitive disadvantage. Therefore, even under the best case scenario, it becomes likely that at least some of Fall River's water-intensive firms will either relocate, close, or move future expansions into the southeastern United States. During the interviews, executives in the water-intensive firms often commented that water and sewer fees are the last reason for remaining in Fall River. Moreover, this single factor provides a tenuous locational advantage, when weighed against the many negatives of operating in Massachusetts and the aggressive development strategies of the southeastern states.

The interviewers asked several questions about plans for workforce expansion or reduction in the near to intermediate term to help assess the possibility that relocations, closures, or out-of-state expansions might occur as a result of the CSO project. First, executives were asked whether their firms would definitely, probably, possibly, or not increase their workforce in the next twelve months (See Table 5.04). Of the thirteen companies represented, five planned definitely to increase their workforces anywhere from three percent to ten percent in the next twelve months. Two firms indicated that they would probably increase their workforces from 5% to 10% in the next twelve months. One firm planned a possible increase in its workforce of ten percent in the next twelve months. Only three of the thirteen firms indicated that they would not increase the number of employees over the next year. However, when asked about their plans for workforce expansion over the next thirty-six months, five of the firms surveyed indicated that there was too much uncertainty on the horizon to answer the question.

Interviewees were then asked to identify those factors that will most affect their decisions to increase or decrease their workforce in the next twelve to thirty-six months. The question was open-ended in order to solicit spontaneous answers from the executives. While company sales and the general performance of the economy were the most frequently mentioned answers, executives at five of the thirteen firms volunteered the impact of the CSO project as a major concern. As a follow-up question, executives were asked if the proposed CSO project had been frequently, occasionally, rarely, or never discussed by their company's board of directors or top officers. Executives representing six of the thirteen firms indicated that the CSO project was being frequently discussed at meetings; executives at two firms indicated that the CSO project was being occasionally discussed at meetings, while the representatives of only four firms indicated that the CSO project had never been discussed.

Executives were asked to explain their main concerns, if any, about the impact on their company of the CSO project. In total, the executives expressed three major concerns about the CSO project. First, the executives' main concern was the financial impact of the project on their company's cost structure, par-

Table 5.04. Fall River Executive Interviews: Workforce Expansion Plans, 12 to 36 Months.

Question: Given your current expectations, how likely is it that your comapny will increase its workforce in the next 12 months?

Responses:	Definite	Probable	Possible	Not	Uncertain	Total
Number of Firms	5	2	1	3	2	13
Anticipated Percentage Increase	3 to 10%	5 to 10%	1 to 10%			

Question: Given your current expectations, how likely is it that your company will increase its workforce in the next 36 months?

Responses:	Definite	Probable	Possible	Not	Uncertain	Total
Number of Firms	2	2	1	1	5	13
Anticipated Percentage Increase	10%	5 to 10%	10%			

Question: What factors will most affect your decision to increase or decrease you company's workforce in the next twelve to thirty-six months?

Factor	Number of Firms
Sales	8
Impact of CSO Project	5
General Performance of the Economy	5
Overall Costs	2
Workmens' Compensation	1
Environmental Regulations	1

Note: Some respondents gave more than one answer to the last question.

ticularly in the form of increased sewer or water fees. This concern was most pronounced among the water-intensive firms and executives at many of these companies volunteered that the possible impact of the CSO project has "made us conscious of the need to keep looking for alternative locations." Second, many executives at non-water-intensive firms expressed a fear that large sewer rate increases would set off a spiral of escalating rate and local tax increases, if water-intensive firms pull out of the City or otherwise close down their operations. There was a definite concern that a narrowing industrial tax base would cause CSO project costs to be shifted onto fewer and fewer companies over time. Thus, companies for whom water and sewer rates are not currently a major cost item expressed a concern that it might become one in the future. Finally, even those executives whose companies are firmly attached to Fall River, and for whom water and sewer rates are not a concern, expressed misgivings that the CSO project was "an enormous cost to a city with so many other problems." The main concern on this account was that the CSO project would crowd out other capital spending that is desparately needed for the public schools, fire and police protection.

A final component of the interviews sought to establish the degree to which various CSO finance scenarios might actually alter business plans to expand, relocate, or close manufacturing operations in Fall River. Executives were provided with three five-year hypothetical scenarios: a six-fold increase in sewer fees, a tripling of sewer fees, and a doubling of sewer fees (See Tables 5.05 and 5.06). Given each scenario, executives were asked whether they would definitely, probably, possibly, or not expand their Fall River manufacturing operations. Given a six-fold increase over five years, executives from nine of the thirteen firms indicated that their firms would not expand manufacturing operations in Fall River. The same response was true of a tripling in sewer fees over the next five years. These answers stand in sharp contrast to the very strong probability reported by executives that the same firms would hire additional employees given "current expectations" (see previous table). Thus, by comparing current expectations to reported plans not to expand if sewer fees triple, it is a reasonable inference that even the best case CSO finance scenario will reverse any plans for future expansion in Fall River's core water-intensive industries. However, *when presented with the prospect of a doubling of sewer fees over the next five years, executives from nine of thirteen companies represented indicated their companies would possibly or probably expand manufacturing operations in Fall River.* In other words, it appears that a doubling of sewer fees is the maximum increase consistent with retaining a viable economic base anchored by textiles and other water-intensive industries.

In addition to the CSO project's impact on expansion plans, the interviews also sought to guage the prospect that various CSO finance scenarios might cause existing firms to either relocate or to simply close their manufacturing operations in Fall River. Again, executives were presented with the same three scenarios and asked whether they would definitely, probably, possibly, or not close their Fall River manufacturing operations. Given a six-fold increase in sewer fees over the next five years, executives from seven of the thirteen companies represented indicated that they would definitely close their Fall River manufacturing operations. A tripling of sewer fees (the best case scenario), would lead executives at five of the companies to consider possibly closing their Fall River manufacturing operations. However, executives from *eleven of the thirteen companies interviewed indicated that they would not close their Fall River manufacturing operations if presented with a doubling of sewer fees over the next five years.* Even then, some firms would probably still close as a result of the sewer fee increases, while other firms would possibly shelve plans for further expansion in Fall River.

Table 5.05. Fall River Executive Interviews: Impact of CSO Project on Closure Decisions.

Question: In constant dollars, if sewer rates were to increase six-fold in the next five years, how likely is it that your company would close its operations in Fall River?

Responses:	Definitely	Probably	Possibly	Not Close	Total
Number of Firms	7	0	1	5	13

Question: In constant dollars, if sewer rates were to triple in the next five years, how likely is it that your company would close its operations in Fall River?

Responses:	Definitely	Probably	Possibly	Not Close	Total
Number of Firms	1	1	5	6	13

Question: In constant dollars, if sewer rates were to double in the next five years, how likely is it that your company would expand its operations in Fall River?

Responses:	Definitely	Probably	Possibly	Not Close	Total
Number of Firms	0	2	0	11	13

There is always some consideration as to the actual mobility of companies, since it has become a common practice for businesses to threaten capital flight whenever any branch or level of government seeks to impose a mandated cost. Executives at many of the companies represented admit readily that their operations are not particularly mobile because of heavy investment in plant and equipment that cannot be easily moved to a new location. However, most of the immobile firms were among those that do not use water-intensive industrial processes. In at least one case, a water-intensive textile firm referred to Fall River as its "last stand." The company considered itself immobile because of recent heavy investments in new plant and equipment and was attracted to Fall River specifically because of its low water and sewer rates. In this particular case, the marginal profitability of the firm would be undermined by any rate increases beyond a doubling of sewer fees.

By contrast, many of the most advanced and profitable textile dyeing and finishing firms are exceptionally mobile because of recent investment in new machinery. One executive suggested that it would be easier for his firm "to leave Fall River than it was for the Colts to leave Baltimore." In the case of some very large textile employers, this claim is not far from the mark. The authors of this study were allowed to conduct an on-site inspection of dyeing and finishing machinery in one of the City's largest plants. It is literally true that such machinery can be loaded onto trucks or aircraft with a minimum of effort and expense. Under these conditions, the task of relocating a firm's manufacturing operations could be done within a matter of days. As a check on these observations, the interviewers consulted with selected officers of the Amalgamated Clothing and Textile Workers Union which represents many of the local workers in these companies. Our conclusions about the easy mobility of textile capital were confirmed by workers with an intimate working knowledge of that machinery. Moreover, it should be noted that in some cases development agencies in the southeastern United States are willing to pay the entire cost of relocation and worker training.

Table 5.06. Fall River Executive Interviews: Impact of CSO Project on Expansion Decisions.

Question: In constant dollars, if sewer rates were to increase six-fold in the next five years, how likely is it that your company would expand its operations in Fall River?

Responses:	Definitely	Probably	Possibly	Not Expand	Total
Number of Firms	0	2	2	9	13

Question: In constant dollars, if sewer rates were to triple in the next five years, how likely is it that your company would expand its operations in Fall River?

Responses:	Definitely	Probably	Possibly	Not Expand	Total
Number of Firms	0	3	1	9	13

Question: In constant dollars, if sewer rates were to double in the next five years, how likely is it that your company would expand its operations in Fall River?

Responses:	Definitely	Probably	Possibly	Not Expand	Total
Number of Firms	0	3	6	4	13

Conservation Pricing and Fall River's Economic Base

At first glance, an observer might conclude that Fall River can readily afford to triple sewer fees in order to finance the mandated CSO project. A tripling of sewer fees would make Fall River's wastewater rates comparable to the average rates charged by communities throughout the United States (Ernst & Young 1992). However, competitiveness and not comparability is the key factor determining Fall River's current rate structure because of the important role that sewer and water fees assume in the larger context of business location advantages.

Table 5.07. Water and Wastewater Rate Structures.

Rate Structure	Description
Uniform Rates	Rates that are the same for all customer classes, at all levels of consumption.
Inverted Block Rates	Rates that increase as consumption increases.
Seasonal Rates	Rates that vary during different periods of the year.
Marginal Cost Rates	Rates that are based upon the cost of providing the next unit(s) of service.
Declining Block Rates	Rates that decrease as consumption increases.

SOURCE: Ernest & Young's 1992 National Water and Wastewater Rate Survey, p. 13.

In recent years, many communities throughout the United States have been motivated to adopt "conservation pricing" in order to discourage water and sewer usage (See Table 5.07). Thus, many communities have adopted various rate structures designed to induce less consumption of water and, indirectly, to reduce sewer discharges. Rate structures in about fifty percent of municipalities in the Northeast have conservation characteristics, while slightly higher than fifty percent of municipal rate structures in the South have conservation charactertics (Ernst & Young 1992, 17). Fall River has continued to maintain a rate structure that runs counter to this national trend. Quite the contrary, Fall River's declining block rate structure means that rates charged to customers decrease as water or sewage consumption increases. Clearly, Fall River's declining block rates are an economic inducement of particular benefit to large industrial users; especially the types of water-intensive manufacturing industries that form the nucleus of Fall River's economic base. In this respect, Fall River's low water and sewer rates constitute a key element of its own economic development strategy.

Ernst & Young's National Environmental Consulting Practice has identified three types of communities where conservation rates are appropriate from an economic standpoint:

* Locations where attracting water using industry is not a community objective.

* Areas where conservation rates would be competitive with adjacent or similar similar communities.

* Communities where conservation rates would be acceptable by utility customers.

By contrast, Fall River's economy is heavily dependent on water-intensive firms; a tripling of rates eliminate its last competitive advantage with Southeastern states; and, based on interviews, a tripling of rates is certainly unacceptable to Fall River's industrial users. Yet, the court's enforcement order and the EPA's Administrative Order will impose a conservation rate structure on the City of Fall River much to its economic detriment.

It should not be assumed that because many of Fall River's major manufacturers are water-intensive that they are by implication water-wasters. During the interviews, executives were asked whether there are any water-conservation technologies currently available to their industries that could offset sewer fee increases. Executives from nine of the thirteen firms represented report that they contantly monitor technological improvements in water and wastewater conservation. As was pointed out by the executives, there are built-in market incentives to reduce water usage wherever possible, particularly in water-intensive industries. Currently, all of Fall River's water-intensive firms use industrial processes that recycle water in varying degrees. Moreover, because Fall River calculates sewer charges based on water-consumption, industrial users have a double incentive to reduce wastewater discharges by adopting water conservation processes. Furthermore, executives in textiles dyeing and finishing firms emphasized that investment in new machinery over the last few years has been partly driven by the effort to reduce water consumption and wastewater discharges.

Fall River's Textile Future

Although the textiles industry long ago abandoned other New England communities for the southeastern United States, textiles continue to be the core of Fall River's economic base. Moreover, the same factors that have allowed Fall River to retain its textiles base have helped to attract water-intensive manufacturers in other industries to the City. Importantly, it should be emphasized contrary to widely held perceptions, that the City's textile firms are a remarkably vibrant, technologically-advanced, and globally competitive industry (Primack 1993). Far from a "dying" industry, the City's textiles firms have adapted to the "new world economy" by undergoing an astounding transition in a remarkably brief period of time.

The nationwide transition from a mass manufacturing economy to a "post-industrial" economy has required U.S. manufacturing firms to make three adjustments (Piore and Sabel 1984). First, the old mass manufacturing processes that relied on skilled and semi-skilled manual operatives have been replaced by robotics and automation that greatly enhance worker productivity and product quality. Fall River's textile firms have generally made the transition to high technology design and production processes (Comm. of Mass. 1993, 168). As an indicator of this transition, executives from five of the textile companies interviewed for this study report making capital investments of $43.5 million in only the last three years. Based on projections from employment data, it is estimated that Fall River's entire textile industry has made a capital investment of $65 million to $80 million toward renovating the City's industrial base since 1990. For example, one of the textile firms visited by the interviewers was in the process of obtaining state-of-the-art machinery that will quadruple productivity in a key component of its manufacturing process.

Second, Fall River's textiles firms tend to specialize in narrow niche markets for high quality fabrics, rather than in the mass manufacturing of low quality textiles. It is the latter types of firms that are moving to offshore and foreign locations (Comm. of Mass. 1993, 168). As the executive interviews suggested, foreign locations are not being considered seriously by most of Fall River's textile firms.

Third, Fall River's textile and manufacturing firms are making the transition toward global competition. Many of the firms reported aggressive strategies for market penetration of Mexico, Canada, and selected high-growth areas of the European Continent (e.g. Spain). Significantly, the frequency with which executives reported marketing strategies aimed at Mexico (and the infrequency of its mention as a favorable business location) suggest that the pending North American Free Trade Agreement may actually benefit Fall River's textiles employment base.

Note

[1] Seven of the sixteen executives spontaneously rated workmens' compensation as a "ten". It is our belief that workmens' compensation would have rated among the top ten factors (at least on a modal basis) had that factor been included in the original questionnaire.

Chapter 6

Summary and Conclusions

The major findings and conclusions of this study of the financial and economic impact of the proposed Fall River CSO project may be summarized as follows:

Federal construction assistance to communities has declined by more than 50% in real dollars during the last 13 years. The original clean water standards imposed in 1972 have remained unchanged and their scope has been expanded by redefining combined sewer overflows as a point source of pollution.

The authors estimate that in Massachusetts, CSO abatement capital costs will be approximately $4.9 billion over the next 15 years if the state is to meet the standards set by its own CSO Control Policy.

Under existing statutes, Fall River will be eligible to receive only a 25% grant equivalency award for the Phase III Construction of the CSO Project. There is no guarantee that the CSO project, or any portion of it, will be financed by the Massachusetts Water Pollution Abatement Trust because (1) current funding levels for the MWPAT are inadequate to finance even the projected CSO needs in Massachusetts, and (2) secondary treatment continues to receive the highest priority in funding eligibility. Thus it is very possible that the City of Fall River will have to finance all or a substantial portion of the CSO project with a municipal bond issue.

According to all standard measures, Fall River's fiscal capacity is among the weakest of municipalities in the Commonwealth of Massachusetts.

According to all standard measures, Fall River's fiscal effort is far above the state average in taxing commercial and industrial property, but is far below the state average in the taxation of residential property and in levying water and sewer fees.

The authors conclude that the low fiscal effort on residential taxation may be explained by the City's economic distress, particularly exceptionally low household incomes and high rates of unemployment.

The authors conclude that low water and sewer fees are a central component of Fall River's economic cost advantages with respect to business firm location decisions and constitute one of the City's chief competitive advantages in retaining its manufacturing base, particular textile companies and other water-intensive industries.

Fall River currently has an average debt load, measured in various ways. Its low fiscal capacity, however, means that the City can generate only below average per capita revenues to repay bonded indebtedness.

Regardless of the source of funding, the CSO project will have a negative impact on Fall River's bond rating. It is like that Fall River's municipal bonds will be downgraded to "junk" status (Ba1, Ba or lower). The CSO project will consume the City's entire debt capacity, effectively prohibiting the City from financing any other capital project for the next 10 to 15 years or longer.

Three finance scenarios have been constructed to assess the probable impact of the CSO project on the municipal budget. The best case scenario involving full financing by MWPAT will require $7.86 million per year in additional annual revenue. This could be achieved by a 331% increase in sewer rates or a 24.8% across-the-board increase in property tax rates.

An intermediate scenario involves half financing by MWPAT and half financing by the City. It will require $10.75 million in additional annual revenues. This could be achieved by a 416% increase in sewer rates or a 34.9% across-the-board increase in property tax rates.

The worst case scenario is full financing by the City. This scenario will require $13.62 million per year in additional revenues. This could be achieved by a 501% increase in swere rates or a 43.08% across-the-board increase in property tax rates.

Even the best case scenario would be in conflict with Massachusetts's Proposition 2-1/2 which limits the amount of tax revenue a municipality can raise. The worst case scenario would cause Fall River to exceed the statutory debt limit and would require special action by the Massachusetts legislature.

The City's economic base is exceptionally dependent on the textile finishing industry and on other water-intensive industries. Firms in these industries are being actively recruited with very attractive economic development packages by southern states.

Water and sewer rates are among the last competitive advantages that Fall River enjoys in retaining its economic base industries. We predict that anything beyond a doubling of sewer fees will eliminate that competitive advantage and put at risk of migration or closure Fall River's water-intensive firms. Consequently, even under the best case scenario, Fall River is likely to lose some major employers to other states. Local expansion by Fall River firms will become extremely unlikely, and Fall River will be less likely to attract new firms in the future.

All presently-possible funding scenarios would increase sewer fees or property taxes or both in order to repay the bonded indebtedness required to finance the CSO project. Yet the research presented in this study suggests that there will be a significant response to such rate increases such that the City is likely to collect less revenue, not more. Firms appear willing to relocate or may be forced to close due to a loss of competitive advantage in competitive world markets. Alternatively, other firms appear willing to cease production of water-intensive products or substitute conservation technologies. While such action would reduce the industrial wastewater flow into the Fall River sewer system, they would not eliminate the overflow problem that occurs during heavy rainstorms. These actions would, however, reduce the funding available to repay bonded indebtedness financing the CSO project. There is at least the possibility that the City may not be able to issue the amount of bonds required to finance the CSO project because financial markets may hesitate to fund so perilous an investment.

If an increase in sewer fees or property taxes or both were to cause the textile industry in Fall River to exit or fail, the loss of jobs would cause the unemployment rate in the Fall River Labor Market to increase to nearly 20% and to exceed 20% in the City itself. The loss of earnings is estimated at $195 million per year, considerably in excess of the one-time cost of the CSO project of $130 million.

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